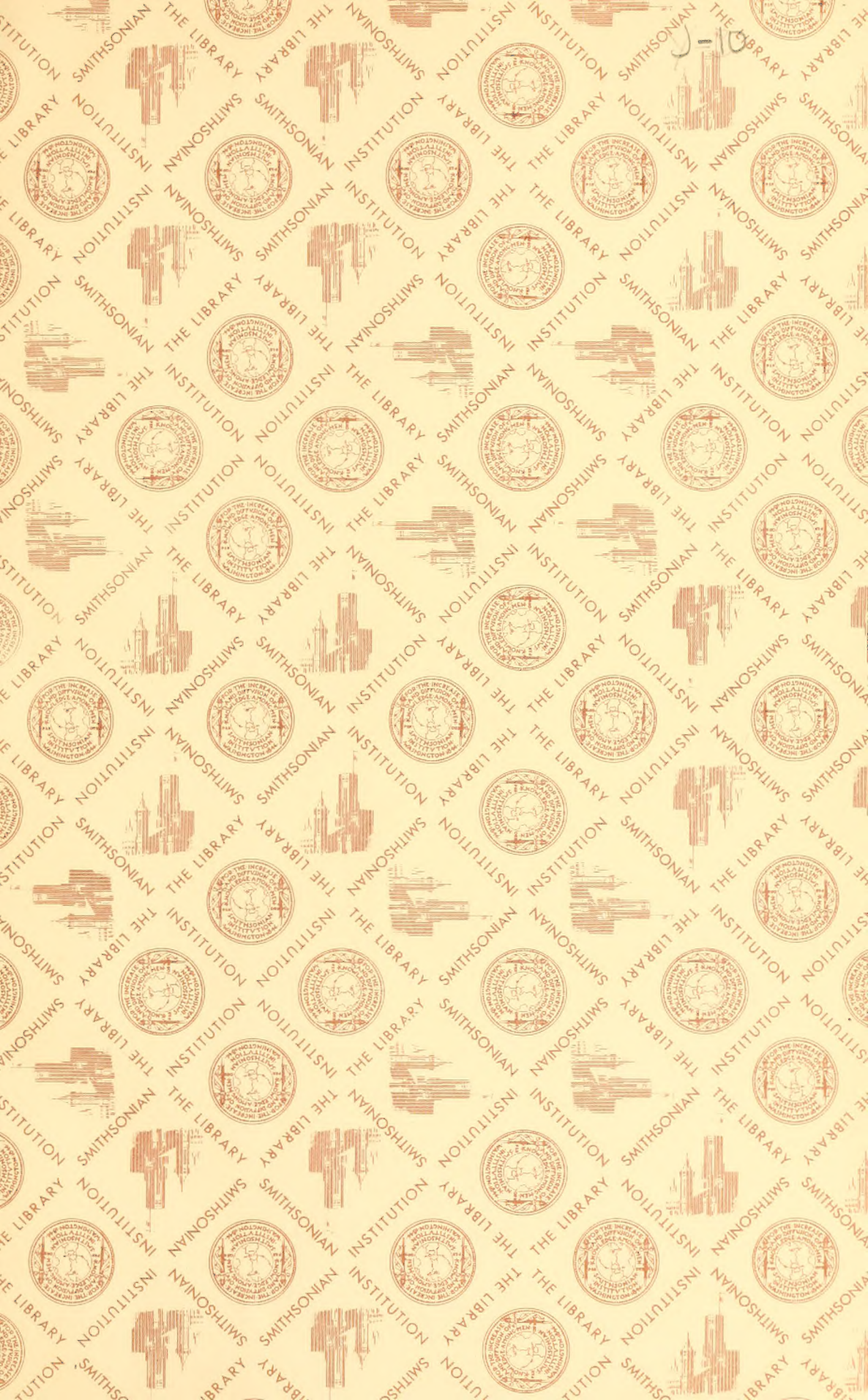






**THE GAME-BIRDS OF INDIA,
BURMA AND CEYLON**

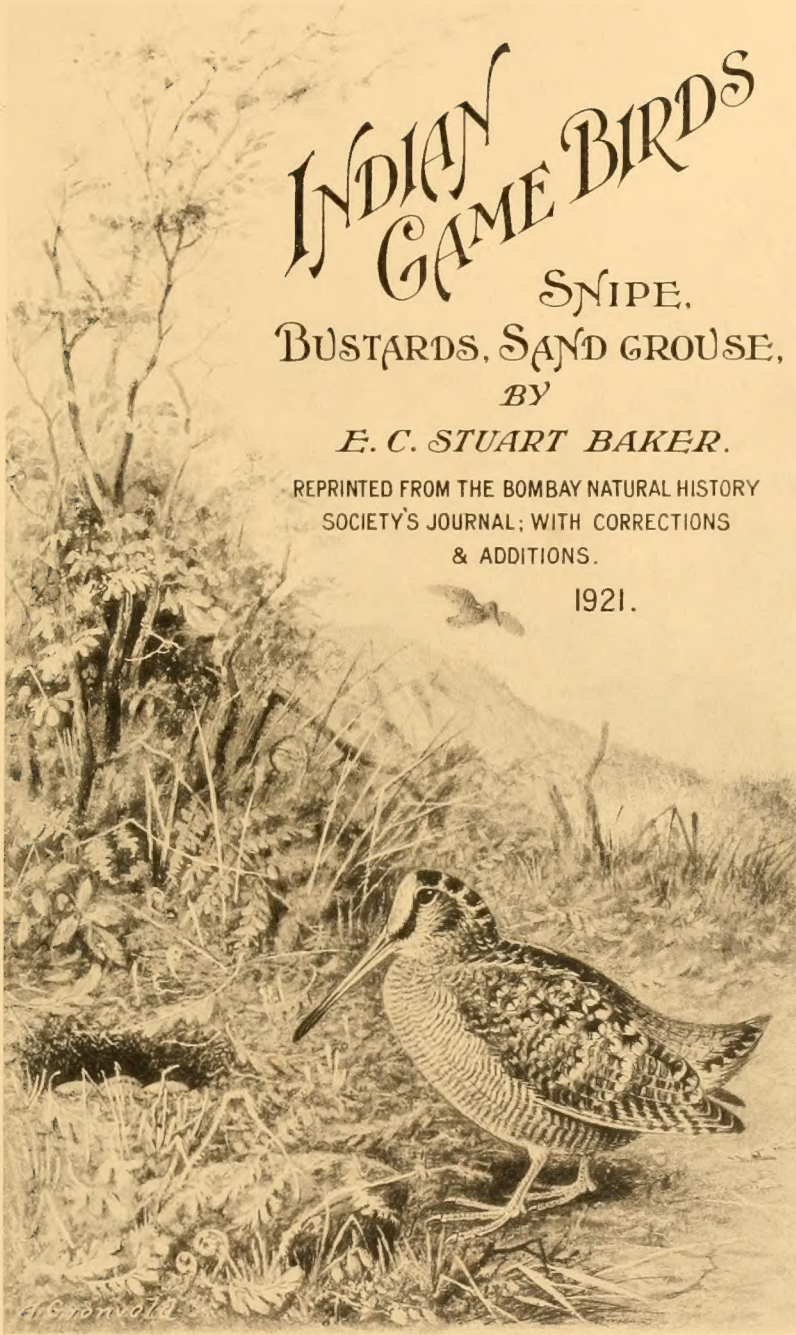
INDIAN GAME BIRDS

SNIFE,
BUSTARDS, SAND GROUSE,
BY

E. C. STUART BAKER.

REPRINTED FROM THE BOMBAY NATURAL HISTORY
SOCIETY'S JOURNAL; WITH CORRECTIONS
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1921.



THE GAME-BIRDS OF INDIA,
BURMA AND CEYLON

SNIFE, BUSTARDS AND SAND-GROUSE

VOL. II.

BY
E. C. STUART BAKER, O.B.E., F.L.S., F.Z.S., M.B.O.U.,
H.F.A.O.U.

WITH 19 COLOURED PLATES

By H. Grönvold.

TWO MAPS IN COLOUR AND SIX BLACK AND WHITE PLATES.

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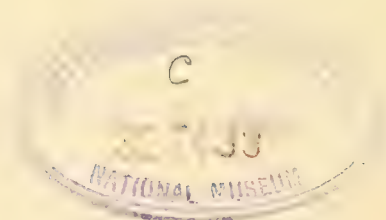
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LIST OF CONTENTS.

	PAGE
TITLE PAGE ...	iii
CONTENTS ...	v
LIST OF PLATES ...	vii
INTRODUCTION ...	ix
BIBLIOGRAPHY ...	xi
INDIAN GAME-BIRDS ...	1-323
INDEX ...	325



LIST OF PLATES.

PLATE		TO FACE PAGE
I.	SCOLOPAX RUSTICOLA. The Woodcock	3
II.	GALLINAGO SOLITARIA. The Eastern Solitary Snipe	36
III.	GALLINAGO NEMORICOLA. The Wood Snipe	46
IV.	{ GALLINAGO G. GALLINAGO. The Fan-tail Snipe } { GALLINAGO GALLINULA. The Jack Snipe }	54
V.	ROSTRATULA CAPENSIS. The Painted Snipe	121
VI.	OTIS TARDA TARDA. The Great Bustard	140
VII.	OTIS TETRAX ORIENTALIS. The Little Eastern Bustard	156
VIII.	EUPODOTIS EDWARDSI. The Great Indian Bustard	165
IX.	CHLAMYDOTIS UNDULATA MACQUEENII. The Houbara or Mac- queen's Bustard	186
X.	SYPHEOTIS AURITA. The Lesser Florican or Likh	199
XI.	SYPHEOTIS BENGALENSIS. The Bengal Florican	216
XII.	PTEROCLES ORIENTALIS. The Large, Imperial, or Black-bellied Sand-grouse	240
XIII.	PTEROCLES INDICUS. The Painted Sand-grouse	252
XIV.	PTEROCLES CORONATUS ATRATUS. The Coronetted Sand-grouse	265
XV.	PTEROCLES LICHTENSTEINI ARABICUS. The Arabian Close- barred Sand-grouse	273
XVI.	PTEROCLURUS ALCHATUS CAUDACUTUS. The Large Pin-tailed Sand-grouse	279
XVII.	PTEROCLURUS SENEGALENSIS ERLANGERI. The Common Indian Sand-grouse	293

PLATE		To FACE PAGE
XVIII.	PTEROCLURUS SENEGALLUS. The Spotted Sand-grouse	... 307
XIX.	SYRRHAPTES TIBETANUS. The Tibetan Sand-grouse	... 316

MAPS.

Map showing migration routes of Fan-tail Snipe		63
Map ,, ,, ,, of the Pin-tail Snipe		97

BLACK AND WHITE PLATES.

A.	Heads of Indian Snipe		76
B.	Under Wings of Indian Snipe		86
C.	Tails of Indian Snipe		107
D.	The Houbara		190
E.	{ Beater in Cutch with Lesser Florican or Likh } { Female Lesser Florican on Nest }		207
F.	A Bag of Lesser Florican or Likh		213

*Note.—The coloured plates in this Volume were printed by
Messrs. Vitty and Seaborne, Ltd., London.*

INTRODUCTION.

THE present volume of Game-birds is the second of the Series which it is proposed to bring out, the first having been devoted to the Swans, Geese and Duck.

It contains the Snipes, Bustards and Sand-Grouse, and further volumes will deal with the Hemipodes or Bustard Quail, Megapodes, Pheasants and Partridges.

The contents of this volume have already appeared in the pages of the Bombay Natural History Society's Journal and but for the war and the resulting dislocation of all work, would long ago have come out in book form. The delay, though unfortunate in some respects, has enabled me to bring the contents more completely up to date than would otherwise have been the case, and it is hoped that the future will not bring to light much more in the way of forgotten names and further alterations.

The many changes which have been necessitated by discoveries in nomenclature since the original articles were written, have been all adopted in so far as specific names are concerned, but the question of the retention of genera or the addition to, or reduction of, their number has been treated almost entirely from the point of view of convenience.

Where a generic name has been shown to be wrong it has, of course, been discarded, otherwise I have refrained from making changes as far as possible.

Some of the illustrations have been considerably altered since their first appearance in the Journal, it is hoped for the better. Three new coloured plates, the Fantail and Jack Snipe, the Great Bustard and the Little Eastern Bustard have been added. Mistakes in the matter recorded in the original letter-press have been rectified, certain additions made and some paragraphs deleted, these being principally such as did not really refer to our Asiatic birds but rather to some of their Western relations.

Geographical races have been acknowledged, but in the families treated in this volume, geographical races are not nearly as numerous or well-defined as they are in certain other groups of Game-birds.

Finally, I may say that in order to facilitate reference a regular sequence in the letter-press for each species has been adopted. First *Synonymy* and *vernacular names*, then *Descriptions* of male, female and young, next *Distribution* followed by *Nidification*, finishing up with *General Habits*.

The Index has been prepared on similar lines and this it is hoped will fully meet the criticisms not unjustly passed on the first edition of "Indian Ducks."

E. C. STUART BAKER.

LONDON,

May, 1921.

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Family CHARADRIIDÆ.

IN 1886, in the 'Ibis,' p. 122, *et seq.*, Seebohm thus discoursed on the position of the Snipes in the great family of "Plovers."

"The Snipes belong to the family *Charadriidæ*, which also includes the Sandpipers, Curlews, Plovers and a few other allied genera. From all these birds they are very easily and very distinctly characterized. Most of the *Charadriidæ* are web-footed; they have a distinct web at the base of the toes, sometimes much more developed between the outer and the middle toe; but the Snipes, some of the Sandpipers, and the Turnstones are exceptions to this rule, having no rudimentary web between any of the toes, which are cleft to the base. Again, most of the *Charadriidæ* have comparatively long legs and short bills; the Snipes on the contrary have short legs and long bills. The only birds in this family (except the Snipes) in which the bill is as long as or longer than twice the length of the tarsus are the females of one or two species of Curlews and one or two species of Sandpiper, none of which have all the toes cleft to the base. The genus *Scolopax* may therefore be diagnosed as follows:—

"*Charadriidæ* having the bill twice as long as the tarsus, and all the toes cleft to the base."

He, however, comes to the conclusion in this paper that one cannot divide the group (excluding *Rostratula*) into genera and that these species must all come under the one genus *Scolopax*.

He first shows that they cannot be divided by any structural diagnosis, the two main points of which may be said to be the amount of feathering on the tibiæ and the number of tail feathers.

He, however, points out that there are two characteristics which divide five members of the group from all others, viz., the nature of the markings on the head and the curious silvery tips to the feathers of the tail underneath.

These characteristics appear quite sufficiently satisfactory, and it is upon these that most naturalists now divide the genera *Scolopax* and *Gallinago*.

Sub-family SCOLOPACINÆ.

The members of this sub-family may be distinguished from all other birds of the family *Charadriidæ* by having no trace of a web between the toes and by having the bill about twice as long as the tarsus. Another striking feature of the Snipes is the curious position of the eyes, which are placed very far back in the head, just above the anterior edge of the ear-orifice. In this country we have three genera—*Scolopax*, which contains the Woodcock only, *Gallinago*, containing the true Snipes, and *Rostratula*, containing the birds generally called Painted Snipes. The genus *Scolopax* includes, according to Sharpe, only two species, viz., *rusticula* and *saturata*. The former, the common Woodcock, is migratory, summering in the Himalayas and extending in the winter to the Plains of India; the latter is found only in Java and New Guinea and but little is known about it. Of the genus *Gallinago* Sharpe recognises twenty species, some of which are migratory and some are not; of these seven species and one doubtful sub-species (*raddei*) are found in India. The genus *Rostratula* is non-migratory and contains three species, of which one, the Common Painted Snipe, is found over most of India and Burmah as well as China, Japan and Africa.

Blanford's key to the genera is as follows :—

- A. Sexes similar in plumage, bill straight.
 - a. Tibia feathered throughout; no longitudinal pale stripes on crown, occiput and nape transversely striped . . . *Scolopax*.
 - b. Tibia partly naked, longitudinal pale stripes on crown and scapulars *Gallinago*.
- B. Sexes different, bill curved downwards at tip *Rostratula*.

The sportsman can always tell the Painted Snipe (*Rostratula*) at a glance by its bright colouration, so different in every way from an ordinary Snipe's plumage.

The Woodcock he can tell, not only by its weight and size, but by a glance at the under-surface of its tail feathers and if these have silvery tips, then the bird is a Woodcock. Again if the occiput and nape are found to be barred, and not streaked, in the character of their markings, the bird is the same.

SCOLOPAX RUSTICOLA.

THE WOODCOCK.

Scolopax rusticola, Linn. S. N. i, p. 243 (1766); Blyth, Cat. p. 271; Jerdon, B. I. iii, p. 670; Stoliczka, J. A. S. B. xxxvii, Part 2, p. 70; Beavan, Ibis, 1868, p. 391; Brooks, J. A. S. B. xliii, Part 2, p. 253; Hume, S. F. ii, p. 482; Anderson, *ibid.* iii, p. 356; G. Austin, J. A. S. B. xlv, Part 2, p. 200; Fairbank, S. F. v, p. 409; Butler, *ibid.* p. 504; Hume & Davison, *ibid.* vi, p. 458; Ball, *ibid.* vii, p. 228; Laird, *ibid.* p. 470; Hume, *ibid.* p. 483; Id. Cat., No. 867; Bingham, S. F. viii, p. 196; Scully, *ibid.* p. 353; Hume & Marsh., Game-B. iii, p. 309; Williamson, S. F. x, p. 517; Barnes, B. of Bom., p. 343; Seebohm, Charadriidæ, p. 502; Hume, S. F. xi, p. 318; Newnham, J. B. N. H. S. vol. iv, p. 52; Osmaston, *ibid.* vol. xi, p. 473; Davidson, *ibid.* vol. xii, p. 66; Stuart Baker, *ibid.* p. 500; Evans, Ibis, 1891, p. 80; Meade-Waldo, *ibid.* 1893, p. 204; Schufeldt, *ibid.* p. 653; Davidson, *ibid.* 1898, p. 39; Stuart Baker, J. B. N. H. S. xx. p. 4 (1910), Finn, Ind. Waders, p. 138; Stevens, J. B. N. H. S. xxiii, p. 728.

Scolopax rusticola, Wharton, Ibis, 1879, p. 453; Id. S. F. viii, p. 500; Legge, B. of Cey. p. 806; Butler, S. F. ix, p. 428; Biddulph, Ibis, 1881, p. 95; Scully, *ibid.* p. 588; Marshall, Ibis, 1884, p. 424; Davison, S. F. x, p. 413; Oates, Birds of B. B. ii, p. 380; St. John, Ibis, 1889, p. 176; Hume, Nests & Eggs, 2nd Edit. iii, p. 349; Sharpe, Cat. B. M. xxiv, p. 671; Blanford, Avifauna B. I., iv, p. 283; Dresser, Pal. Birds, p. 726; Oates, Cat. Eggs of B. M. vol. ii, p. 66; Sharpe, Hand-L. vol. i, p. 166; Oates, Game-B. ii, p. 428; Inglis, J. B. N. H. S. xii, p. 500; Bourdillon, *ibid.* vol. xvi. p. 10; Fulton, *ibid.* p. 63; Ratray, *ibid.* p. 663; Ogilvie-Grant, Bull. B. O. C. clvi (1st Jan. 1910); Harington, Rangoon Gazette, 19.6.11, Lambton, J. B. N. H. S. xx, p. 855; Whitehead, *ibid.* p. 974; H. R. Baker, *ibid.* p. 1154 (1913); Arbuthnot, *ibid.* xxiii, p. 777 (1915).

Woodcock, Douglas, P.Z.S. p. 159 (1917).

Vernacular Names. *Simtitar*, *Tutitar*, Hin.; *Sim Kukra*, Kumaun and Nepal; *Chinjarole*, Chamba; *Daodidap gadeba*, Cachari; *Simpoo-khlav*, Khasia; *Kangtruk*, Manipur; *Wilati Chaha*, Chittagong; *Bumpal* or *Dhābhā*, Chitral; *Gherak*, Drosh; *Chustruck*, Gilgit.

Description.—Forehead and sinciput grey, generally with a dark mark on the forehead. Occiput and nape with three broad trans-

verse bands of velvet black, divided by yellowish or rufous lines. A deep rufous-brown, almost black, line running from the base of the bill to the corner of the eye; a second similar line below eye and posterior ear-coverts; ear-coverts and cheeks grey, with numerous rufous-brown spots. Upper parts and wing coverts rufous-grey with numerous bars of brown and rufous; the lesser wing coverts brown and rufous only and the scapulars broadly black on the inner and white, yellowish white, or pale grey on the outer webs. The primary coverts are rufous with bars of grey, finely edged with dark brown. The primaries and outer secondaries brown, the latter notched on the outer webs with rufous, the notches being palest on the outermost feathers. The quills are also margined with pale rufous at the tips. The inner secondaries are barred right across with alternate bands, broad of brown and narrow of rufous. Rump and upper tail coverts barred rufous and black or rufous and brown; as a rule in the longest coverts the terminal half is almost pure rufous.

Tail-feathers dark brown or black, notched or barred with rufous and tipped grey above and broadly silver-grey below.

Chin white or nearly so, remainder of lower parts dull greyish white, barred throughout with narrow rufescent bars which become darker and more numerous on the upper breast, often running into one another and forming dark patches. On the abdomen and flanks posteriorly, the bars are sometimes centred with a paler tint.

The Adult Female does not differ from the male in plumage. "The female is larger with the colours more dull" (Jerdon). "Males have . . . the back more of the pale brown and grey, and the rump less red than the female." (Yarrell), *i.e.*, Yarrell makes out the female to be a more rufous bird than the male.

Young Birds.—"Differ from the adult in being darker and having creamy-whitish, instead of ashy, spots at the end of the dorsal and scapular feathers; the lower back, rump and upper tail coverts are plainly barred across with dusky brown, and the tail feathers are not largely notched with sandy brown on their margins, but have a narrow sub-terminal line of sandy buff between the ashy tip and the black of the rest of the feathers. The outer web of the primaries has a distinct series of fulvous notches." (*Sharpe*).

The question of the alleged differences in the young bird have

been taken up lately by Ogilvie-Grant and in the B.O.C. Bulletin, he thus sums up the result of his observations. "It will thus be seen that . . . Gould . . . implies that the Woodcocks with tooth-like markings on the outer web of the first long flight-feathers are the young birds of the year.

"This statement has been generally accepted as correct.

"The investigations which I have undertaken during the last few years have clearly proved the entire fallacy of this theory."

He then explains how he shot many breeding birds in the Azores—an unfortunate but necessary proceeding—and also obtained young birds of the year from Messrs. Meade-Waldo and Sir Richard Graham.

Ogilvie-Grant then comments on Seeborn's description of the differences between the young and the old bird and says that his investigations have "clearly proved that it is impossible to distinguish between the plumage of the male and female Woodcock, or between old and young birds of the year, when once the latter have fully developed their flight feathers."

Nestlings.—"Covered with a velvety down of a rufous colour with a broad band of chestnut down the centre of the crown, and another down the centre of the back with three broad transverse bands down the sides of the body; on each side of the crown and dorsal stripe a broad streak of isabelline; a black loreal line and a central streak on the forehead also black; under surface of body pale rufous, inclining to isabelline on the abdomen, and with some chestnut patches on the throat and foreneck." (*Sharpe*).

Colours of Soft Parts.—Iris deep brown, almost black. Feet green grey or livid grey, or grey lead colour, claws generally paler and more fleshy. Bill dusky, base brown, paler and tinged with purple at the base of the lower mandible.

"The legs and feet are pale bluish, brown or drab, or fleshy plumbeous or grey, or livid grey, or bluish fleshy-grey, generally more or less shaded dusky on the boints; and the claws are fleshy-brown, pale brown, blackish-brown or dusky.

"The bill is dusky to blackish-brown at tip, the rest pale drab brown, fleshy-brown with a bluish tinge or almost plumbeous; often nearly white, or fleshy-white at the base of the lower mandible." (*Hume*).

Measurements.—“Length 13·0 to 15·0 inches, wing 7·2 to 8·0, tail from vent 3·0 to 3·85, tarsus 1·35 to 1·57, bill from gape 2·28 to 3·3, weight 7 to 12·5 ozs.” (*Hume*).

“Total length 15 inches, culmen 2·85, wing 7·5, tail 3·5, tarsus 1·55.” (*Sharpe*).

Adult Female.—“Total length 14 inches, culmen 3·2, wing 7·3, tail 2·9, tarsus 1·4.” (*Sharpe*).

The Indian birds which I have examined from the Indian Museum and the B.N.H. Society's Museum and other skins sent me from Madras and Kashmir are as follows in their dimensions:—

Males.—Culmen 2·7 to 3·1 inches, wing 7·30 to 8·30, tarsus 1·50 to 1·80.

Females.—Culmen 2·90 to 3·25 inches, wing 7·20 to 8·50, tarsus 1·40 to 1·80.

The question of comparative size of the two sexes is one which has been very much discussed and the law has been laid down by various authorities in various ways. Thus Jerdon says that the female is the larger bird of the two, Sharpe makes out that it is a much smaller bird with a longer beak. Hume sums up his opinion thus: “they show absolutely no constant difference in the size of the sexes.” My own opinion supports Hume's, and I find that though the birds vary enormously in size there is no difference in the ranges of size between the sexes. One gets adult males as small as the smallest female and big females as big as the biggest males.

I have made very careful inquiries amongst sportsmen and others concerning the comparative size of the sexes and have found most of them under the impression that one sex or the other—their ideas varied as to which it was—was much bigger than the other. This is undoubtedly due to the fact that it takes a woodcock more than one year to grow to its full size and the difference in dimensions between a bird of six months old and one of eighteen months is very great.

Another question which has never been settled is the reason or cause of the curious grey phase of colouration so often met with in the Woodcock. The colouration of this variety looks as if it had had all the red pigment washed out of it. I have been unable to explain this myself in any way. I have proved that it is not sexual and I



THE WOODCOCK

Scolopax rusticola

3 life size

have also ascertained that though it is much more common in young than in old birds it is by no means confined to the former. Colonel Wilson, to whom I owe thanks for much information and many useful notes, once showed me two birds shot by him on the same day in Shillong, Khasia Hills, which might have been taken for different species, so unlike were they in tone of colouration. In this case the older, heavier and bigger bird was in the grey phase and, if I remember rightly, both grey and rufous birds were females.

It would appear, therefore, that in India young birds are more frequently grey than are adults, but that this phase of colouration is by no means confined to the former. In fact I have myself seen fully adult birds almost as grey in tone as the Solitary or Wood Snipe.

Ogilvie-Grant (in *loc. cit.*) observes: "The Woodcock is more or less dimorphic in plumage, *i.e.*, two more or less distinct phases of plumage are found; some birds have the general colour of the upper part greyer, while in others it is richer and more rufous. The grey phase and the rufous phase occur in both sexes alike, in fully adult birds; but as far as my experience goes, the grey phase is never found among young birds, which are always more or less rufous. These represent what is often described by sportsmen as the smaller rufous 'species' of Woodcock."

Ogilvie-Grant in this same paper discusses an apparent disparity in numbers between female and male Woodcocks and notes that out of sixty Woodcock shot during the breeding season in the Azores only four were females, and that out of eleven young birds sent him from Cumberland only one proved on dissection to be of that sex. As, however, he himself remarks, when one goes in for shooting rôding Woodcock one can hardly be expected to get many females (fortunately). As regards the young birds this may be only an exceptional case and it is hardly safe to take it as an example of the general rule.

In India there appears to be no difference in the numbers of the two sexes. Unfortunately in both the Calcutta and Bombay collections we have but few sexed specimens, and it is to be hoped sportsmen will help in settling this question one way or the other.

Yet another point about our Indian Woodcock which is unsettled is the question as to whether or not the Indian bird differs in any respect from that found in Europe and Northern Asia.

It has hitherto been considered a generally accepted fact that our Indian Woodcock is a smaller bird than the English, but I cannot endorse this. My reasons are as follows: Everyone who has studied migration knows that young birds are more erratic in their travels, travel greater distances and to much more unusual districts and countries than the older birds. Now certainly all those Woodcock obtained in the plains and lower hills of India and *possibly all* which are shot south of the Himalayas are birds which are on migration for the cold weather, and those which travel furthest and are most often shot are the young birds of the year; hence, because the birds we *shoot* are smaller than the average English bird we have come to believe, that the whole race is smaller. This idea is not, however, borne out by my researches, which have shown me that fully adult Indian birds are as big as European specimens. Thus I have had two female Woodcocks sent me (*shot off the nests*) which measured in wing 8.30 inches, whereas my largest bird shot on migration is well under 8.0 inches.

Hume says that he thinks the Indian bird is smaller than the English but discounts the value of his opinion by what he says later on, when, in talking of the triangular emarginations on the primary quills of the wing, he writes, "Yarrell says: 'These marks are indications of youth,'" and then Hume adds: "It is a curious thing that out of twenty-seven Indian-killed specimens now before me, these triangular marks are present in every specimen; only in two or three have they disappeared from the basal half of the feather. Our museum does not contain a single Indian-killed specimen with the whole of the outer web of the first quill entirely plain." From Hume's own words, therefore, we assume that his opinion was formed on a series of immature birds, although his deductions are somewhat upset by Ogilvie-Grant's recent discoveries.

The only way the question can be determined is by the measurement of adult birds in their breeding haunts either during or just prior to the breeding season. Here again the sportsman and field naturalist must come to the fore and assist the scientific man who works in the museum.

In regard to the weight there is no doubt that the majority of birds shot in India are lighter than those shot in England, but the

reasons which account for their being smaller would also account for their being lighter. Hume comments on the comparative weight of Himalayan (?) and English birds at some length, but his conclusions are hardly convincing, especially when one remembers, as has already been shown, that they are based on deductions made from a series of probably immature birds. He says that only five birds out of fifty-three weighed exceeded 10 ozs., whilst the weight generally was between 7 and $12\frac{1}{2}$ ozs., and he compares this record of weights with a bag made in Ireland.

"In only five out of fifty-three birds has the weight exceeded 10 ozs., and of these five the weights were: 10·5, 11·5, 12·0, 12·0, and 12·5 ozs. Out of $53\frac{1}{2}$ couples shot . . . in South-west Ireland twenty-seven weighed between 12 and 14 ozs. six between 14 and 15 ozs. and one between 15 and 16 ozs. . . . Our fifty-three birds weighed: between 7 and 8 ozs. fourteen; between 8 and 9 ozs. eighteen; between 9 and 10 ozs. sixteen; above 10 ozs. five. There is an undoubted instance on record of a Woodcock in England weighing 27 ozs." I have found it difficult to obtain weights of Indian-killed birds, but the few I have obtained of *fully adult* birds do not seem to show that our birds are much inferior to English when in good condition and full-sized. Thus Colonel Wilson writes me: "I have only weighed one bird, as it struck me as being bigger than usual; this weighed 13 ozs., and was the bird I sent on to you."

Later in 1911 and 1912 Colonel Wilson again gives the following weights of fifty-five more Woodcock shot in three years: Average of fifty-five birds, 10·60 ozs.; 10 ozs. and under, eighteen; 11 ozs. and under, twenty-two; 12 ozs. and under, twelve; between 12 and 13 ozs., three.

Major H. R. Baker records one of 16 ozs. shot in the Nilgiris, and Captain Lambton one of $14\frac{1}{2}$ ozs. from the same hills. He also notes that whereas birds shot early in the season rarely exceed 8 ozs., those shot in March average between 10 and 12 ozs.

Captain C. R. Douglas gives the weights of seventy-two birds shot in the West of Ireland, and the average works out as 11·82 ozs., *i.e.*, more than an ounce heavier than the Indian ones. The lightest bird was 10 ozs., and there were only two below 11, whereas in Colonel

Wilson's list thirty-four birds were below this weight. On the other hand, whilst Colonel Wilson's heaviest bird only pulled $12\frac{3}{4}$ ozs. in Captain Douglas' list, there were two of 14 ozs. or over and eight of 13 ozs. or over. It is interesting also to note that of Captain Douglas' birds, those killed after Christmas exceeded those killed before Christmas by nearly an ounce.

Of Colonel Wilson's birds practically six out of seven were killed in the early part of the season between October and January; many just after arrival on migration, so that the difference is fully accounted for.

Dr. Moore shot birds in Dibrugarh weighing 12, 13, and 14 ozs., and Mr. Mondy sent me a bird which weighed just short of 14 ozs. Any of them would have equalled good English birds, and though the weights are admittedly exceptional for Indian birds, this is only because it is also the exception to shoot any but young birds in the plains and lower hills of India, whilst even in the higher hills of Southern India mature birds seem to be but seldom shot.

Dr. W. Moore writes to me anent the weight of his Woodcock as follows:—

"The first two I shot, both on the same day, weighed $14\frac{3}{4}$ ozs. each, and though I shot no heavier birds than these, afterwards some ran them very close, and of eighteen I weighed none were under 12 ozs. except one, and that was obviously a bird in very poor condition.

"I found Woodcock in Dibrugarh on the burnt chapries (grass lands) near damp forest, feeding on the parched and crippled insects brought to earth by the recent fires."

Distribution.—Outside our Indian limits Seebohm thus describes the habitat of the Woodcock: "Our Woodcock is a semi-arctic bird, ranging from the Atlantic to the Pacific. In Scandinavia it breeds up to latitude 67, in West Russia to 65, but in East Russia and Siberia not much above 60. Its southern breeding range extends to the Azores, Canaries, Madeira, the Alps, Carpathians, and Caucasus, to the Himalayas (where it breeds at an elevation of 10,000 feet, and to Mongolia and the mountains of Japan. It has not occurred in Iceland or in Greenland, and once only in the Faroes; but accidental stragglers, no doubt driven westward by storms, principally from the

Azores, have been met with on the American Continent, in Newfoundland, New Jersey, and Virginia.

Within Indian limits the Woodcock is a resident throughout the Himalayas, where it breeds freely above 10,000 feet, and often at even lower elevations. Thence in the cold weather it migrates in considerable numbers to every portion of the Indian Empire where there are suitable hills and mountains. It has been frequently shot in Ceylon and in the Burmese hills as far south as Tenasserim, it is found in all the hill ranges of Southern India, and is common in the sub-Himalayan ranges during the winter months. As might be expected, where the country is adapted to sportsmen and shooting is more or less easy, the Woodcock is said to be more common than elsewhere. Thus in the Nilgiris, about Ooty, it is quite common though it is reported to be far less so in the Assamboo Hills, and to be comparatively rare in the Palnis, Shevaroyes, &c. That is to say where the sportsmen can get at the birds in comfort, he goes out and finds them common, whereas where the cover is heavy and the ground difficult he goes out far less often and sees far fewer birds.

Exactly the same conditions are found in the North-east Frontier. The Khasia Hills appear to have been forested with an especial view to provide good shooting for Woodcock, and therefore tradition has long demanded that every sportsman who wishes to be known as such must pursue this bird for all he is worth. Hence it is known to be more or less common, and the hard-working gunner may work up to nearly a hundred birds in a good season; indeed, Colonel Wilson only just missed his two hundred birds in one season. Next to the Khasia Hills are the North Cachar Hills, in fact they form part of the same range. These, however, are either very heavily forested or are covered with bamboo. The latter is seldom in India, as far as I am aware, frequented by Woodcock and the former is too heavy to allow of shooting small game with any comfort; the consequence is no one ever attempts this form of sport and the cock is said to be rare. The fact is, I think, that anywhere between 1st November and 1st March, in hills over 4,000 feet elevation, one should be able to find Woodcock if sufficient time and trouble is given to the search and there are suitable places for the birds to lie

up in. In the plains the matter is different, and here Woodcock are only rare visitors, though chance birds are met with, generally in December and January, in many parts of the country. In Burma they seem to descend to the lower countries, often almost to sea-level as Oates says, more frequently than they do in India. Still, even in the latter country, wherever there are hills near by, cock are sure to be found at more or less frequent intervals during the cold weather.

The late Mr. P. W. Mackinnon informed me that "Woodcock arrive at Mussoorie in October early, about 1st, and leave by 15th March, Mussoorie 6,000 feet."

According to Venning, who writes from Haka: "Woodcock are fairly plentiful in the cold weather in the Chin Hills, frequenting wooded streams and marshy pools. This year I found three together in one small swamp on no less than four occasions. On another occasion I shot the same afternoon one Woodcock, two Wood-Snipe and a Fantail Snipe."

In Dibrugarh, in Lakhimpur, which is surrounded by lofty hills at no great distance, anything from five or six to a dozen are shot annually. In Cachar one or two are seen or shot each cold weather and the same in practically every district of the Assam Valley. In Dibrugarh there are a few places which are almost a certain find for an odd cock or two during December and January, and Mr. F. Moore, who made a point of looking up these birds, always succeeded in getting from four to a dozen birds each year he was in this district. In Sylhet Cripps reported it to be so common that he had known of as many as four brace being obtained in a single morning. Once, however, we get any distance from hills cock only appear as rare stragglers, and in these cases it is probable that birds migrating from one range to another are, as the Irishman said of the owl, benighted by day and have to stop where they are until the succeeding sunset. In this way Woodcock have been shot in Guddam (Golconda), Kurrachee, Sitapur, Agra, Mynpuri, Cawnpore, Dacca, Rangoon, Tavoy, Calcutta, Madras, Kanara (away from the hills), Taipuo, Bombay and many other places.

Nidification.—There are two points in connection with the breeding of the Woodcock which call especially for remark; first is the curious

manner of flight during the breeding season, somewhat analogous to the drumming of Snipes; and secondly, the habit the Woodcock has of carrying its young from one place to another.

As regards the rôding of the Woodcock, as its habit of flight during the breeding season is called, this is described by Seebohm as follows:—

“The Woodcock does not drum like the Snipe, but during the breeding season, like that bird, the male forgets for a time his skulking habits and flies backwards and forwards, uttering a peculiar note, which, though unquestionably proceeding from the throat, must be regarded as analogous to the drumming of the Snipe. This peculiar habit of the Woodcock is described as rôding and is indulged in early in the morning and late in the evening, in the pairing season, sometimes before it reaches its breeding grounds, but more often after its arrival there. This rôding continues for about a quarter of an hour, during which his peculiar notes are uttered, sometimes singly and sometimes one following the other.”

Dresser, quoting Ekstrom gives in greater detail the manner in which the Woodcock rôdes. He writes:—

“During the first days of spring the Woodcock commences rôding the instant the sun has sunk below the horizon, but at a more advanced period somewhat before its final disappearance, and continues until nightfall. In the morning it begins rôding whilst it is still quite dark, and ceases previous to its being full daylight. When he rôdes there is always an interval between each *tour* and *retour*, which is more observable in the evening, when it goes and returns there several times. The first time it always flies higher and generally with rapidity, the second its flight is but little above the tree-tops, and commonly slower, the third time still nearer the ground and yet more leisurely.”

Oates, who quotes both these authors adds: “when flying about in this extraordinary manner the plumage is puffed out and the flight is rather slow.”

Oates' remarks agree well with what was told me by a game-keeper in Wales, who said that he had observed Woodcock just before they left in March rôding outside some of the spinnies I mention later in my account of a day's shooting in Wales. This man informed me that just at dusk the cock came out of the cover and sailed slowly backwards and forwards a few times in front of it. At

first the flights were high, but gradually the birds got lower and lower until reaching the level of the scrub they again disappeared into it. Each flight was said to be in the shape of a long arc, the highest points being reached at the end and commencement of it, whilst in length they were anything from 50 yards to 200 or more. The bird was described as flying slowly with plumage puffed out, head thrown far back and bill somewhat pointed upwards. I did not inquire how many times the flights were repeated, but the impression I obtained was that they were numerous and lasted for some time.

In this country Mr. F. Wilson, whose note I have already quoted, seems to be the only writer who has recorded anything in regard to these nuptial flights. Major J. Lindsay Smith has, however, written me an interesting letter on the Woodcock and its habits in Dungagali, and he says in this that he has often observed them rôding; and that whilst thus engaged this bird utters "a rather harsh croak alternately with a sharp whistle or squeak, something like that of a bat, but very much stronger."

The habit the Woodcock has of carrying its young from one place to another is very well known, but there are not many descriptions of how the carrying is done.

Davidson saw the bird in the act of carrying its young in Kashmir, but has unfortunately left but little on record about it. He observes:—

"On the 28th May I found a pair with small young ones and distinctly saw one of the old birds carrying a young one between its feet or legs. It flew only some 50 yards, but though I followed at once, I not only failed to find the young bird, but could not even put up the old one again, and on returning could not find the young one that I had previously noticed on the ground."

Littledale also records having seen the same occurrence. He writes: "to my delight up flew a Woodcock about five yards from my feet. She had a young one—the men said two young ones, but I could not see two distinctly myself—in her claws pressed close under her; and she flew slowly and heavily for about ten yards, then rested above a bramble which the young one seemed to catch hold of with its claws, or become entangled in. The old bird fluttered

for quite half a minute over it, before she could pull the little one clear and fly a few yards further down, when she alighted but rose again, when I sent a man to try to catch the young one."

A friend in Scotland to whom I wrote to obtain information on this point informs me that he has only once *certainly* seen the Woodcock carry its young, though he believes that on two or three occasions when he has disturbed cock in spring they carried away a young one with them. On the occasion he refers to as having distinctly seen what happened, he writes *in epistolâ* :—

"We came on this bird very suddenly and she rose almost at my feet and made off with a young one held tightly up against her breast, and I think, held on either side by her claws. As she left three young ones behind her when she first flew away, I at once hid myself and awaited to see what further she would do. In a few minutes back came the old lady and dropped on the ground close to the nest and after scuffling about a bit she grasped one of the young ones on either side and picked it up. As she rose I could see that her extended legs held the young one low down on either side, but she at once drew up her legs close to her body and then appeared to be holding it between her breast and thighs, this of course owing to the contracted position of her legs. Once started she flew quite easily to some distance, but seemed to find it rather difficult to get a comfortable hold of the young ones at first. She removed all four a distance of nearly 50 yards within about a quarter of an hour."

It is not definitely known whether both parents share in the labour of removal, but it is probable that such is the case. Indeed, from Davidson's note given above, it would appear rather as if whilst he was following one of the parent birds, the other had carried off the remaining youngster.

It is possible that the removals are not always due to the birds being disturbed, and it may be that they are undertaken also for the purpose of getting to fresh feeding grounds. Some game-keepers, indeed, assert that Woodcock constantly and habitually thus carry their young to and from their nest and the feeding grounds. On several occasions young Woodcocks known to be in one place have been found removed to some distance, although, as far as was known, no disturbing element had approached the original nest site.

The Woodcock breeds very freely throughout the Himalayas at 10,000 feet upwards and probably also very much lower down,

Whether its breeding range extends to the east as far as the more lofty ranges of the Naga Hills and Manipur is very doubtful, and there is nothing to show that it breeds in any of the Burmese hill ranges.

Although so many oologists have taken its eggs in India, there is curiously little on record about its nidification therein. Hume when he wrote the 'Game-Birds' remarked on this, and noted that of the many who had taken the nests, the only account he possessed was that given him by Anderson, which he quotes as follows:—

"On the 30th June, I turned my face towards the snows in another direction, determined to consider my expedition a failure so long as the discovery of the breeding haunts of the Woodcock, which was one of its chief objects, still remained unachieved. After two days' stiff marching I pitched camp at a place called Kemo, at an elevation of some 10,000 feet over and against Namick, which is celebrated for its salt springs.

"We were following up a huge wounded *Presbytes schistaceus* through a dense undergrowth of ringals, when a Woodcock rose close to us, dropping again almost immediately, disappearing in the cover. A diligent search revealed the long-looked-for prize, four eggs, which were deposited in a slight depression in the damp soil, and embedded amongst a lot of wet leaves, the *thin ends* pointing *inwards* and *downwards* into the ground.

"The eggs found (I could see they were hard-set), I told Triphook I had no intention of leaving the place without bagging the bird. It was raining heavily and bitterly cold, with the thermometer down to 40°; but fortunately for us, before we had time to make ourselves comfortable under an adjoining tree, the bird flew back in a sort of semi-circle, alighted, and ran on to her nest. No sooner down than she was off again, frightened, as I subsequently learnt, by one of our dogs, but which at first thoughts alarmed me not a little, as I thought she was removing her eggs. After having satisfied myself that my suspicions were unfounded, it was decided, as I had done my duty in finding the nest, shooting the bird should devolve on Triphook, and right well he did it, considering all the disadvantages which militate against having a snap-shot in dense cover and a thick mist. I never do anything but miss on such critical occasions; at any rate, I would rather someone else made a *null* of it than myself. ^z

"The eggs were a most beautiful set . . . they are far *darker* and *redder* than the usual run of Woodcocks' eggs, all four resem-

bling the *second* figure in Hewitson's work, and in the character of their markings they are not *unlike richly* coloured specimens of some Terns' eggs."

Osmaston has an account of the finding of a nest in the Tons Valley, especially interesting as in this case there was no attempt to carry off the young; the mother, when disturbed, attempting to divert attention by feigning being crippled. He says that after finding the mother and tiny young, only a day or two old, the former "all the time I had been inspecting her brood had been going through the strangest of antics with outspread wings and tail, and making a continual sort of grating, purring noise. She allowed me to approach within a few feet, and then, with an apparent effort, half fluttered half ran away."

Rattray took a large number of nests of the Woodcock in Changla Gali, Danga Gali and other places near Murree. In the B.N.H.S. Journal (*in loc. cit.*) he records: "This bird breeds freely round Changla Gali from about 8,500 feet upwards. I saw eight or ten pairs, and found some five nests, each containing the usual four eggs. The nests were all in thick forests and generally under a shrub-like Rue. The nest is a typical one. I hope next year to get a good photo of a sitting bird and settle the question I lately ventilated in the 'Field' as to birds sitting with eyes closed and bill resting on the ground."

The typical nest referred to is that shown by Rattray in the beautiful photograph which accompanies his article. This shows a nest formed by a depression in a mass of leaves and rubbish lying on the ground under a thickly foliated bush.

The Woodcock sits extraordinarily close on hard-set eggs or young. This year, 1920, Dr. H. N. Coltart and I had a very good example of this. We had located a Sparrow-hawk's nest which the keeper was desirous of destroying, and the three of us sat down on the ground to discuss the way to get it. Eventually the keeper put on the climbing irons and went up the tree, a very long and difficult job, whilst Coltart and I sat on the open ground below. Dead oak leaves lay thick everywhere, though, the season being very late, there was no undergrowth, but we had not rested some ten minutes before Coltart got up and from almost touching him a Woodcock rose and flew away, leaving visible her nest and four young.

These latter, although so tiny, two still had half their eggs on their tails, at once crawled away under the leaves and hid, and even when we took them up lay with eyes shut as if dead. When we visited the nest the following day they had all been removed.

In India the Woodcock seems seldom to breed before May, and generally not before the end of that month. Osmaston found young birds on the 17th June in the Tons Valley. Davidson says: "On the 24th and 25th May we obtained two clutches of its eggs consisting of four slightly incubated and three fresh eggs, and on the 28th May I found a pair with small young ones." This was in Kashmir near Ganjadgar, and I have eggs in my own collection taken by Rattray at Danga Gali as late as the 14th June. Lindsay Smith records hard-set eggs as late as the end of August, and he twice came on nests and eggs, broken by cattle, at the end of July.

In Europe they seem to breed a great deal earlier than in India. Many commence breeding operations in March, and I have European eggs taken in March, April and May, my latest date being that of a clutch taken in Germany on 25th May. They are, however, sometimes much later than this. Davidson writing to me on the 6th August says that as he is writing there is a Woodcock sitting on four eggs in his own preserves, and he adds that this is the third sitting, the bird having hatched off two previously.

Hewitson says that the "Woodcock lays its eggs amongst the dry grass or dead leaves which form the surface of the woods and plantations which it frequents. It is an early breeder, frequently having young ones in the middle of April."

Yarrell describes the nest as being "all in dry warm situations amongst dead grass and leaves without any attempt at concealment. The nest was wholly composed of dead leaves, chiefly the common fern, loosely laid together and without any lining.

"It would, however, be more proper to say beds than nests; for like those of the Plover, they are merely slight hollows, formed by the nestling of the birds in dry, soft spots or on the fallen leaves."

Seeböhm (Eggs of British Birds) merely says that the nest is placed on the ground and is little more than a hollow scratched in the earth and lined with a few leaves and a little dry grass.

The eggs appear to be *always* four in number, and I have no

information as to any full clutch numbering less. Typically the eggs are far more tern-like in character than like snipe's eggs as one would have expected. As a rule they are broad ovals, distinctly pointed at one end and sometimes *slightly* "peg-top" in shape, but *never* the actual peg-top of the true snipes' eggs. The texture of the eggs is fine and smooth and often has a considerable gloss, which is more or less permanent, as I have eggs in my collection more than twenty years old which still show a fine glossy surface.

Hume thus describes his eggs:—

"The ground colour varies from pale yellowish-white, through various shades of buff and buffy-stone colour to a reddish café-au-lait. The markings, never very densely set and at times very sparse, consist of different shades of brown, brownish-yellow and brownish-red on the one hand; and greys, from sepia to purple, on the other. The former occur in moderate-sized blotches, spots and specks as primary markings. Often these are more numerous in a cap or zone about the large end. Occasionally not a single blotch or spot is $\frac{1}{10}$ of an inch in diameter, and nine out of ten are little more than specks; but in other eggs many of the blotches, especially about the large end, are a $\frac{1}{4}$ of an inch and upwards in length. The greys, pinkish, lavender, sepia, occur as small clouds, spots and smears, secondary or surface-looking markings, rarely either large or thickly-set, except when amongst the blotches of a zone or cap when the eggs exhibit such.

"A large series, chiefly Northern European, vary from 1.5 to 1.8 in length and from 1.3 to 1.5 in breadth. I have no Himalayan eggs, but I suspect that like the birds they would average smaller than European specimens."

My eggs which comprise series from Scotland, England, Germany and India agree well with Hume's description except one clutch from Germany which has a red café-au-lait ground with dense blotches and smears of rich vandyke brown and a few subsidiary blotches and smears of deep lavender.

My Indian eggs average $1.6'' \times 1.32''$ ($= 40.6 \times 33.5$ mm.) as against an average of $1.70'' \times 1.34''$ ($= 43.1 \times 34.0$ mm.) for English and Scotch eggs, and $1.69'' \times 1.32''$ ($= 42.9 \times 33.5$ mm.) for German eggs. My biggest egg is one from Germany, measuring $1.86'' \times 1.54''$ ($= 47.2 \times 39.1$ mm.); my smallest is from Scotland and measures $1.49'' \times 1.26''$ ($= 37.8 \times 32.0$ mm.).

It will be seen that the measurements of my eggs do not bear out Hume's opinion as to Indian birds being smaller than European but rather endorse my view that Indian birds average small because they are immature.

Seebohm gives the size of the Woodcock's eggs as being 1·8 to 1·6 inches in length and 1·4 to 1·3 in breadth.

Dresser gives the average size as being 1·75 × 1·32 inches.

General Habits.—For some reason the Woodcock always forms a most fascinating object of pursuit for the sportsman. It does not matter whether it is a cold, hazy morning on the Welsh coast, a sweltering day in the foot hills of the Himalayas, or a balmy day in the lovely climate of December in the Nilgiris or Khasia Hills; the owl-like flip-flap of the brown bird's wings brings the same little thrill to the gunner, and the soft thud amongst the bracken and bushes in reply to a successful shot brings a feeling of pleasure that is, for some reason, paralleled by the slaughter of few other game-birds.

The haunts of the Woodcock are in themselves attractive and one can wander, gun in hand, through sombre pine forest, sunlit copse of oak or the dense scrub of an Indian ravine always with a certainty of being interested, whatever the sport may be. There is something in one's surroundings which makes one take an optimistic view of life, and it is not until one returns to buildings and the cook has worked his will on the results of the day's bag that one once more remembers that "only man is vile."

My experience of cock-shooting in India, is, unfortunately, practically nil. I have shot a casual cock in the plains of Cachar and of Kamrup and more than occasionally have bagged a brace in North Cachar but I have never had the delight of a long day's trudge through the bracken and pine forests of the Khasia Hills, in which I lived so many years. Perhaps the most successful of the many sportsmen Shillong has harboured was Colonel Wilson, formerly of the 8th Gurkhas, and to him my thanks are due for much information and a most interesting account of his first cock in 1908. He writes:—

"They generally arrive after the 15th October (though I see in 1890, I killed one on the 8th), and I generally begin to look for them

about that date, this year without result till the 23rd. On that day, I happened to have for my morning parade 'exercise in hill climbing,' so took my men up the side of the big hill overhanging Shillong, which is pretty well covered with pine forest.

"On parades like this, during the shooting season, I consider it legitimate to carry a gun, and to take my two spaniels 'Celer' and 'Audax' with me.

"We, that is, my following of about 100 men, my batman with the cartridge bag, the two dogs and myself, start up the hill within half a mile of my house. A road runs zigzag up the hill through forest and a hundred yards or so to the right of the road flows the stream which forms part of the station water supply. We pound steadily up the hill until we have already marched about a mile and a half, up some 1,100 feet. Here I think the men may as well halt to get their wind whilst I go down to look at the stream.

"'Celer' and 'Audax' go into the wood above me and presently one of them gives tongue. I see nothing, but from some little distance up the hill I hear the wings of a bird clicking against the branches of the trees as he flies, a sound I have noticed with both Woodcock and Pheasant at home. A second later, he gives me the type of shot I love best, coming towards me high overhead. I throw up the gun, fire, and as I lower it, see the cock crashing down through the branches. The orderly picks him up, and not having seen me shoot one for at least seven months, asks what he is to do with it, thereby showing to how great an extent the present system of training the individual soldier to think for himself acts on some individuals. Not having sufficient command of his vernacular to tell him exactly what I should like to, I merely order him to bring it along.

"On returning to my small command, who have by this had a good five minutes' rest, the bird is duly admired, and we fall in and plod still further up the hill. On reaching the top we turn to the left along the edge of the Government reserved forest, passing some likely-looking ground, but as I should have to halt my men to try it, it is scarcely the game to do so now, so I call off the dogs, who are only too keen to work it. Along the crest of a hill for a mile or so, and then we begin to descend; half-way down, a stream runs almost parallel to, and about fifty yards from our path, and as I can keep in sight of the men, I think it quite legitimate to work it.

"Just at this moment, the dogs rout out a brace of rufous-necked Partridges from amongst the bracken beside the path, and both are added to the bag.

"The bed of the stream looks, and usually is, a grand place for a Woodcock. Here and there are swampy bits, or patches of bracken, while both banks are covered with fern and *Daphne*, with a fairly thick pine forest over all.

"The dogs hunt this valley for about 600 yards down to the bottom, but there is no sign of anything till I am just coming out of the wood, when I hear a flutter to my right, and the orderly shouts he has put up a bird.

"I push my way through the grass, cobwebs and bushes, and ask if he has marked it down.

"He says he has, so we walk it up, I see a small brown shape flitting through the undergrowth, and the second cock of to-day is added to the bag; we then come out and rejoin the sepoys on the road and march home, the result of the morning's work being a march of seven miles up and down about 1,100 feet over fairly rough country, with a brace of Partridges and two Woodcock to show at the end of it, all done within two and a half hours."

It will be seen from what Colonel Wilson writes that we do not in India get birds in the numbers they are obtained at home. In Shillong and its vicinity four or five birds in a day's tramp must be considered fair sport and six to eight birds something quite out of the common. Colonel Wilson has shot eight to his own gun in a day and Mr. Faichnie, of the Postal Service, once formed one of a party who got nine, but I have heard of no bigger bag to one gun in a single day's shooting. In the Nilgiris, Hume says "ten or twelve birds to two guns in a morning is quite an unusually fine bag, so it must not be supposed that they lie thick as a rule, and yet in particular parts of the hills five or six are sometimes shot out of one tiny shola, not perhaps above thirty yards wide and not a quarter of a mile in length." The largest bag recorded for India is that mentioned by A. Grahame Young in Hume and Marshall's "Game-Birds of India" twenty-eight years ago. This bag was made in the Tos Forests in Kullu. Hume quoting him, thus records the bag. "The end of January is about the best time for them. The largest bag that I know of was thirty-three birds to two guns between Nuggur and Ryson; a good many others were missed. If the season be at all favourable, one is pretty sure of flushing a dozen or so in the course of a day in the favourite haunts."

The biggest bag to a single gun for all India is undoubtedly that obtained by Mr. S. L. Whympere, who describes in a letter to me how he got them.

"It was late in January, 1908, and there had been heavy and continuous snow in the higher hills, and this no doubt had driven

the cock down to the lower levels in greater numbers than usual. It had been a very severe winter all through and birds of various species were driven down below their usual winter haunts; I remember seeing *Merula albicincta* and *M. castanea* at the very foot of the hills on several occasions that year. Bhim Tal, where I shot these cock, is at an elevation of about 5,000 feet, and the Woodcock ground there was a long straggling nullah running far above three miles between the lakes and wherever there was suitable cover it really seemed quite full of cock on this occasion; I saw five birds get up all at once from a little swampy field and got a nice right and left, always an event with cock. Eventually I got no less than twenty-two cock that day and thirteen the next over pretty nearly the same ground. Some of the birds, though by no means all, were in very poor condition, showing they had had a bad time before reaching the lower hills, and it would seem that many of our Himalayan birds may be almost residents, only moving to lower levels when winter comes on.

"I never saw anything like the same number of cock in India either before or since this occasion, and in something like twenty years' shooting eleven was the greatest number I ever got in a day at any other time, but I have never shot in the Neilgherries where I daresay this bag has often been exceeded. At the time these birds were shot this nullah was excellent cover for cock, a small stream ran down it, and its sides were bushy with scattered trees and occasional swampy patches and a little rice cultivation adjacent, but alas! drainage and clearing ruined it some years after this from a sporting point of view and it was not worth the trouble of a visit the last few years I was in India."

Colonel A. B. Dew shot nine cock in one day round Gor on the right bank of the Indus between Bungi and Chilas, and Major H. L. Haughton informs me that they are nearly always to be found there in fair if not large numbers.

In the hills of Southern India they appear to have decreased greatly of late years, for Captain Lambton writes that while in the early sixties a single gun had been known to bag 250 cock in one season, in 1910 a sportsman would be considered lucky to bag between forty and fifty.

Hume writing of their favourite haunts thus describes them :

"Cover and running water are what in India the Woodcock most affects; you may find them alike in the middle of deep forest or thick Ringal jungle near the banks of some rushing hill streamlet, foaming and sparkling in its rushy bed, where save a few tiny

velvety corners, there seems no single spot in the neighbourhood where they can possibly feed: and again in clumps of low scrub in a treeless opening where some stream debouching in a clayey basin converts this into a mossy swamp, through which its movements are to be detected only at the further end where, as if ashamed of its late sluggishness, it gushes out to resume its late brawling descent. But, swamp or stream, the water must be moving to please the Woodcock, and though there are exceptions to this rule, you will generally hunt in vain mountain swamps and tarns, where there is no outlet and the water is stagnant, though all the surroundings and adjuncts be everything, apparently, the breast of Woodcock can desire. In England we find them beside little stagnant ditches and pools in coverts: but in India I have seldom so seen them, having almost always flushed them in the neighbourhood of running water."

In the Khasia Hills they undoubtedly generally affect places within easy reach of running water, but this is possibly because in these hills it is difficult to get away from it and they certainly sometimes lie up in small patches of swamp which are not directly connected with any running water for some distance. Thus, until it was eventually drained, a Woodcock could always be put up in a tiny patch of swamp not fifty yards by twenty which was at the bottom of my garden in Shillong. I never allowed a gun to be fired here, and the birds soon became curiously tame, never rising until one was within a very few yards of where they squatted. Colonel Harington also records that four birds were shot and others seen in the Government House Gardens inside the Fort, Mandalay, in the early part of 1911.

Colonel Wilson has recorded a similar instance in his own compound.

"Speaking of the little place in my garden, it is a bit of rushy swamp, about 20 yards long and 10 wide. On one side of it is open grass, and on the other a bank on which grow some brackens, bushes, and about a dozen pine trees. Early one morning, I let the dog into it, and a Woodcock jumped up almost at once, flew over the dog, and pitched on the grass where he squatted about 5 yards off with his tail spread like a Turkeycock's, awaiting developments. The dog worked up to the end of the marshy bit and knowing there was a bird there turned and came back towards me.

"When the cock thought he was too close to be pleasant, he again executed his manœuvre of flying over the dog, and I distinctly

saw him use his beak to lever himself, as it were, into the air. This time he pitched where I could not see him, and when he rose again he evidently meant going, so I let fly and very nearly bagged an old native woman in the next compound as well."

In connection with this little piece of swamp the same writer has commented on the regularity with which Woodcock return year after year to the same piece of ground.

"I soon discovered that to find Woodcock with any certainty a good spaniel was required, as well as an intimate knowledge of the ground, for one Woodcock succeeds another in a favourite spot, just as one Trout succeeds another behind a big stone in a burn at home, and in Shillong the places the cock mostly frequent are few and far between.

"The unwillingness of the cock to leave a favourite spot, so long as any cover at all remains, is shown by the fact that both last season and the season before, I got an occasional bird within thirty yards of my house, fifteen from a much-used footpath, and about fifty from some stables. This was a cosy little bit of covert in the old days, before the ground was so much built over.

"There is a drain and slightly marshy bit of ground in the midst of our Regimental Lines where the cock feed at night still, although the barracks have been inhabited for close on forty years."

In England, of course, cock-shooting is indulged in under very different circumstances and with very different results, and I was fortunate enough on one occasion in Wales to participate in a shoot in which three guns got forty-nine couple of cock in a very few hours. We had been shooting three days a week over the rough country all round the south coast, obtaining small, mixed bags of pheasant, partridge, hare, &c., anything from ten to thirty brace a day, but never, as far as I remember, had a cock shown itself. On the day in question, a crisp November morning in 1894, we start our morning trudge with a beat through some bracken bordered by a tiny copse of oak and scrub on the crest and with a ditch and some swampy ground at the foot of the hill. As we enter the bracken a hare breaks and is neatly turned over in the open by H., the gun on my left hand. The report, however, puts up a small covey of partridge, out of shot, which sweep over the little copse and pitch in a field just over the covert. Finishing the bracken without further result we turn round and beat the far side of the hill for the partridge, I, as right-hand man,

taking the deep bracken lying just inside the oak trees. We have only gone some hundred yards when we walk into the birds, which have scattered a little, and four are added to our bag. I have one shot and a miss at the partridge, but as I fire I catch a glimpse of what I am sure is a woodcock which gets up and flits through the trees to my right, but on saying so I am merely laughed at for my pains, as the cock are not supposed to be in. I, however, insist on beating back through the spinney on my own account, and hardly have I got well inside when two cock are up and off before I am ready for them. Within five paces, however, another gets up and falls to my shot, and as he falls another rises and is missed. Before I can load the spaniels have another bird in the air, and by the time I have walked the spinney through, five birds have been dropped, and at least as many more missed. After this the other guns come up, and after inspecting my bag it is at once decided that a large flight must have just come in and that the original day's shoot should be abandoned for the purpose of hunting up the most likely places for the cock.

Their favourite haunts along these coasts are the numerous small copses and spinneys which nestle in between the hills, sometimes running a little way up the sides, often surrounded by a fringe of light scrub or gorse and nearly always with a tiny stream trickling down the centre and losing itself in the swamp at the foot. We soon come to one of these little woods and arrange to work it from the bottom upwards, one gun taking the centre and the other two the edges. As the guest I am given the best place in the centre, but before we get into the wood itself two cock are put up from the bracken at the edge of the swamp and are downed with a pretty right and left by my host. No more birds are seen until we are well inside the cover, when a single bird gets up from the mossy bed of the tiny stream just in front of me and is promptly bowled over. A second gets up within a few yards, but I miss badly and the bird jinks away to my right, and I hear the bang, bang of H., gun No. 3, a good shot who has doubtless accounted for him.

For some time I get no more shots, only putting up one bird which flops out of my sight before I have time to take a snapshot at him. The birds seem to be lying up in the holly bushes and gorse on the edge of the copse, and both my neighbours are getting repeated shots,

and soon one of them, missing a double shot, turns a cock my way and he comes towards me in and out of the trees with his curious owl-like flight, and though he escapes my first barrel the second brings him down almost on my head. I then get a pheasant and miss another cock, but finish up the beat with a nice right and left at a pair of wood-pigeon.

Counting our bag we find that B., our host, has six cock, a pheasant and a rabbit, H. two pheasant and four cock, and myself a pheasant, two pigeon and two cock.

Our next beat is a narrow strip composed of scrub and holly bushes intermixed with a few bigger trees fringing a ditch of running water which here and there widens out into small patches of bracken-covered swamp. This is too narrow for three guns, so B. goes ahead and stands at the end, whilst we beat up to him. A start is made by H. with a right and left at pheasant, and we then walk half-way through before we get another shot, and we begin to think the birds are not so thick after all. Here, however, from a dense patch of holly bushes the dogs put up four cocks together and we have the pleasure of accounting for all four, though, to level matters, we each miss a comparatively easy shot immediately after. Yet again we have four birds in the air at the same time, but we only drop three; two are picked up at once, and whilst hunting round for the third another bird gets up between H. and myself and flies straight towards me; neither can shoot until he gets almost up to me, when he rises and tries to dodge back but is bowled over with a lucky shot just in time.

So on through the strip with constant shots all through its length and, curiously enough, in this bit of cover we keep putting up the birds three and four almost together with intervals in which we put up none at all. The taller trees are scanty and the bracken very withered, so the cock are all hiding under the small clumps of holly-bushes and brambles at the very edge of the swampy pieces. The shooting is easy in the comparative absence of the taller trees and we find when we get through our beat that H. has nine birds to my ten and that our host has beaten us both with twelve cock and a pheasant.

We do not have such luck, however, with our next beat, which is a pine-wood with very little undergrowth and no water. Here we put

up three or four cock only and get but one, though we add a couple of rabbits and one more pheasant to the general stock. Leaving this wood we work through a scarp facing the sea and covered with bracken, gorse and brambles, whilst every few yards a cheerful little cascade goes tumbling down into the sea below us. Both rabbits and cock are very numerous here, but the walking is terrible and, having but one arm both to shoot and climb with, I frighten a great many more birds and rabbits than I kill, indeed I emerge at the other end of the scarp with but one cock and two rabbits, a result exactly doubled both by H. and B., the latter adding a brace of partridge out of a covey put up on the fields above him by some labourers.

Yet another scarp succeeds this one, but the walking is better, and out of the seven birds collected here I claim three, having only missed one. This beat brings us up to the farm where we have lunch, a Welsh lunch of cold birds, apple tart and Devonshire cream washed down with draught beer. Half an hour more for a smoke and our host makes us turn out again to take full advantage of a day's shooting of a kind that does not come too often.

Walking down the lane, a small boy says he has seen a cock pitch in some brambles by a pond in the field to our right, and, sure enough, the dogs turn him out, and B. adds him to the fast-swelling bag. From here we make for three small spinneys, divided from one another by about a hundred yards or so, and themselves covering only two or three acres each. Our host and B. each take one corner and send me on ahead to shoot the gaps, and very pretty shooting I get. They have hardly got into the first spinney before a couple of shots are heard, and a few seconds after a cock comes flitting towards me out of the last few trees, and as he passes I bowl him over; a little fluff of feathers rises into the air, a soft thud on the grass, and before we can pick him up, a second bird is dropped almost on the top of the first, and no sooner are my cartridges home than a third follows. Then I have two long shots and misses, and, whilst reloading, another passes over me before I can shoot. Both B. and H. are in sight now, and I prepare to move on to the next gap, but as I turn round a cock flies almost into me and, giving him a little law, he too finds his way to grass.

The second gap is a repetition of the first, but here I put in six

misses to three kills, as the birds do not fly so kindly for me. The last spinney is best of all; the birds seem determined to favour me, and I get two shots to every one by the two guns inside, and when they come out I am able to show them thirteen birds, of which six have been the result of the last spinney, besides a wood-pigeon and a pheasant. The others between them have fifteen cock, two rabbits and a brace of pheasants, so we have every reason to be jubilant. We have now eighty-eight cock, a bag never beaten here before, but we are not yet finished. Another long pine wood with bracken and hazel on the outskirts only gives us a single bird, but a hazel copse a few yards further on gives us three more, and but for my bad shooting should have given us five. Then we pick up two odd birds, one from a holly hedge near a pool, and another from a bracken patch bordering some turnips. By this time it is getting late and the birds are now in the open feeding, and H. gets one as it flaps overhead, making its way from one feeding ground to another. Only a few minutes more of daylight remain, and we hurry for the last beat on our way home. Here we find that there are still lots of birds, but it is getting too dark for good shooting, and we miss more than we hit, so that only three more birds are brought to book. We have now ninety-eight birds and our host insists on our trying to make up the hundred, but three or four more misses in the gloaming at silent things more like bats than birds, and one bird lost in the dark are the only results, so we have to be content with making the biggest bag of cock recorded in my host's shooting experience. A tramp of two miles to the carts in the fast gathering dark and then home after a long twenty miles' trudge and the best day's small game-shooting I ever hope to have.

Contrasting well with Colonel Wilson's account of shooting in the Khasia Hills and with ordinary cock-shooting at home is the account given by Tickell of cock-shooting in Nepal which is quoted by Hume.

"Woodcock-shooting in Nepal is laborious work from the steepness of the hills and the spongy nature of the ground which the bird frequents. We found them on light, rich mould, thickly matted with grasses, ferns, and other weeds, and everywhere furrowed by little rills of water trickling through the tangle, or here and there stagnating in little pools or 'bog-holes' concealed under a layer of vegetation

which formed tolerable pitfalls to the unwary intruder, receiving him sometimes up to the hip. The jungle on these hills is pretty thick, but not lofty, consisting mostly of briars and thicket: and it would have been impossible to get a fair shot within it, were it not that some of the largest rills (perhaps a yard broad) bordered with mossy turf, formed narrow vistas through the tangle, up and down which the birds when flushed would fly, giving some chance for a snapshot. We had no dogs, a luxury known to very few Indian sportsmen, but employed beaters to find the game. I had never even seen cock-shooting in England, and my first day's experience of it in Nepal surprised me not a little. I was a good snipe shot in those days, and, imagining from the general resemblance of the two birds that a Woodcock must fly like a Snipe, I was much taken aback, when hailed to 'look out,' at perceiving what appeared like a large bat coming with a wavering, flagging flight along the little lane-like opening in the wood where I was posted; but in an instant, ere I had made up my mind to fire, the apparition made a dart to one side, topped the bordering thicket, and seemed to fall like a stone into the covert beyond. These sudden jerks and zigzags, in the midst of its otherwise dilatory flight, are terribly puzzling to a novice. The bird alights also in the same fashion, dropping at once down as if it had flown against a wall. They were not numerous in Nepal, and two couple bagged to one gun during the afternoon was considered very fair sport. We found them only on the low spurs bordering the open valley of Kathmandu, on its northern side—on such slopes as were of the description above given, looking more like the copses and hazelwoods of England than the forests of India."

Tickell's remarks on the bird's flight are very good and to the point. At home the bird is a strong, good flier, and the curious indefinite manner it has of flying is often far more puzzling to a beginner than the flights of swifter straighter-going birds. Its very haunts, of course, add to the difficulties of shooting, as in addition to its naturally zigzag flight, it is constantly twisting and dodging to escape obstructions; then too, the light is often not of the best, and the extreme silence of its rise and flight is in itself disconcerting. There is no warning whirr of wings or "pench" as of a snipe rising, the first thing is you see it, perhaps only as it flits behind some impossible jungle, barely giving time for a hasty snapshot.

In India the Woodcock seems to be of a far more tame and confiding nature than it is in Europe, and this also affects the flight as the bird makes no effort to get away at any pace when it is flushed. Hume writes:—

"When migrating they are said to fly strongly and well, but when flushed, the flight is at first slow, uncertain and Owl-like, and ceases suddenly, the bird dropping instantaneously behind some bush. I have never had any sport with Woodcock in Northern India. I have often shot them, rarely more than three in a day; but they gave no sort of sport. They fluttered up flushed by the dogs or some beater within twenty yards, and were knocked over by a snapshot as they hung wavering on first rising. One shot them because they were so good to eat; in every other respect they were not worth shooting. They don't seem to fly a bit as Woodcock do in covers at home, where even a good shot is at times balked; but, like Snipe, and almost every living thing domiciled in this 'clime of the sun,' they seem to have become listless and sluggish."

The manner in which Woodcock are said to perform surgical operations on their own wounds has been often alluded to, and is a common belief with gamekeepers and others; indeed, many sportsmen whom I have met are quite convinced that the apparent attention which has been paid to a wound is the intelligent work of the bird itself. Thus Colonel Wilson writes me:—

"On two occasions I have noticed instances of the so-called wonderful way the Woodcock has of doctoring itself. One day I wounded a bird, saw it go off badly hit, but failed to pick it up. A fortnight or so later I flushed a bird in exactly the same place and got it. It seemed in very poor condition, and on examining it, I found it had what looked like a regular splint on one of its legs formed of a tiny piece of stick most carefully bound round with feathers. The other case was one of a bird which had evidently escaped from a snare. A great patch of skin had been torn off just above the wing, and this was covered with a poultice of feathers beautifully attached to the feathers growing in the bird's body."

Of course, these works of art are the result of accident, not design, and are caused by the birds lying in muddy places. The wounded part, in most instances wet with blood already, naturally gets covered with mud or clay to which feathers, tiny sticks and grass adhere and make a poultice which doubtless may be in some instances as effectual as a splint or poultice made by design. I once shot an owl with a badly smashed thigh, how caused I do not know, but it had been lying in muddy grass-land, and the breast next the wounded leg and the whole thigh itself, had become densely matted with feathers, chips of grass, mud and blood, which formed a perfect

plaster of Paris splint; and in addition to this, in lying down the bird had had the wounded leg forced up against the breast where the foot had stuck to the feathers and mud, so that it might have been said that not only had the bird arranged a splint for itself, but had also put its foot into a sling to prevent its moving about.

The Woodcock is generally considered rather a stupid bird and an easy prey to trappers and snarers, who take full advantage of his weak intellect.

They are said to be regularly trapped in the Nilgiris and parts of the Himalayas, and certainly in the Khasia Hills snares are to be found set in almost every place known to be haunted by Woodcock.

In Latham's Synopsis, Vol. iii., p. 130, there is a very quaint description of the Woodcock. Amongst other things Latham notes that "they are stupid birds and often taken in nets placed at the openings where they come out of the woods and return to them in the evenings, which they do in particular paths; they are also caught in springes placed on the ground, or near it, sometimes by the legs, at other times by the neck; for as these birds will not walk over the least obstacle which projects in their way, it is usual to place a range of stones and in the avenues between to set springes, by which means many are often taken."

The Woodcock is a very silent bird and but little is on record about its voice. The male is said to have a hoarse, grating note called "a bleat," "a croak," "a jarring chuckle," by various writers. Mr. Osmaston speaks of the noise made by a female Woodcock disturbed in its brooding as being "a continuous sort of grating purring noise." Hume says that as far as his own experience goes the Woodcock is mute in the cold weather, but he quotes Mr. Wilson as writing of them in their summer haunts: "At this season they are seen towards dusk, about the open glades and borders of the forests on the higher ridges, flying rather high in the air in various directions and uttering a loud, wailing cry." Hume also quotes "European authors" to the effect that the Woodcock has "a very peculiar call-note, first one or two snorts, a hollow, coarse, somewhat lengthened nasal sound, followed by a short, fine sharp sort of whistle, which when one is accustomed to it, may be heard to a considerable distance."

The diet of the Woodcock ranges over rather wide limits. Tickell says it will swallow a lob worm whole, I have found tiny snails and water shells in its stomach, and on another occasion a bird I examined had been feeding entirely on some small white worms, of a very wiry hard consistency. It feeds on grubs, beetles, insects of almost any sort, and will also swallow spawn of frogs. It is almost entirely a nocturnal bird, even more nocturnal than crepuscular, feeding after dark or only a very short time before nightfall. In the day it lies up and sleeps, and at this time is usually found in a dry spot, though near water.

The Plate.—This is an excellent one. The bird in the background represents the grey phase of colouration. As regards the bird in the foreground all that need be said is that the white round the eye is too conspicuous and the bill is not a normal colour. It is true that in a few birds the tint of the bill may be as depicted, but, as a rule, there is always a more flesh or horn-coloured tinge about it.

It must be remembered that the range of variation in the depth of colouration of the Woodcock is very great, and though the plate is a very fine example of one shade, many birds will be found to be paler, especially on the lower parts, whilst some again may be obtained even darker than this bird.

In life the eye of the Woodcock seems even larger, darker and more lustrous than it is shown to be in the plate.

Genus GALLINAGO.

The genus *Gallinago* contains seven species of Snipe as found in India in addition to the sub-species *G. raddei*. Of these seven species one is the Jack Snipe, *G. gallinula*, which is by many naturalists placed in a separate genus, *Limnocryptes*. The differences, however, between this and the other Snipe consist mainly in their internal structure, such as the sternum, which has four instead of two emarginations. These differences are not apparent to the field naturalist or sportsman, and I therefore follow Blanford and unite all our Indian Snipes in one genus.

Since the fourth volume of the "Avifauna of British India" was written we have added both *G. media* and *G. megala* to our list of Indian birds, so that these have now to be incorporated in the key to the species.

The differences between the Common Fantail, *G. gallinago gallinago*, and the Eastern Fantail, *G. gallinago raddei*, all depend upon comparison and are dealt with when these birds are described.

The following key is one which should suffice to enable any one to distinguish the various Snipes, and the distinguishing measurements given in it allow for an ample margin on either side. Thus it will be found that whereas the Jack Snipe's bill rarely exceeds 1·8 inches, that of the other Snipes will but seldom be found under 2·2 inches and that, probably, only in birds of the first year.

Key to Species of Gallinago.

- A A pale median band on crown, bill exceeding 2 inches.
- a. Wing exceeding 6 inches, borders of scapulars white . . . *Solitaria.*
 - b. Wing under 6 inches, borders of scapulars buff or rufous buff.
 - a'. Distance between tip of shortest secondary and that of longest primary not exceeding 2 inches . . . *Nemoricola.*
 - b'. Distance between tip of shortest secondary and that of longest primary exceeding 2 inches.
 - a''. Outer tail feathers narrow and stiff, under '3 inches broad.
 - a'''. Tail feathers twenty-six in number, the eight outer on each side less than '2 inches broad . . . *Stenura.*
 - b'''. Tail feathers twenty in number, the six outer on each side less than '3 inches broad . . . *Megala.*
 - b''. Outer tail feathers not exceptionally narrow or stiff.
 - c'''. Three outer tail feathers not pure white and marked with dusky spots and bars . . . *Gallinago.*
 - d'''. Three outer tail feathers pure white, unmarked . . . *Media.*
- B. No pale median band on crown, bill always less than 2 inches *Gallinula.*

GALLINAGO SOLITARIA.

THE EASTERN SOLITARY SNIPE.

Gallinago solitaria, *Hodg. Gleanings in Science*, iii, p. 238 (1831); *Id. J. A. S. B.* vi, p. 491; *Blyth, Cat.* p. 272; *Jerdon, B. of I.* iii, p. 673; *Stoliczka, J. A. S. B.*, xxxvii, Part 2, p. 70; *Blanford, ibid.* xli, p. 73; *Hume & Hender., Ladak to Yarkand*, p. 286; *Prjev. in Rowley, Orn. Misc.* iii, p. 91; *Hume, Cat.* 869; *Scully, S. F.* viii, p. 353; *Hume & Marsh., Game-B.* iii, p. 333; *Hume, S. F.* ix, p. 283; *Scully, J. A. S. B.* lvi, p. 87; *Hume, S. F.* xi, p. 319; *Fletcher, 'Asian,'* Feb. 1898; *Sharpe, Cat. B. M.* xxiv, p. 654; *Id. Hand-L.* i, p. 166; *Blanford, Avifauna B. I.*, iv, p. 290; *Oates, Cat. Eggs B. M.* ii, p. 64; *Id. Game-B. of In.* ii, p. 446; *Finn, In. Waders*, p. 142; *Harington, J. B. N. H. S.* xix, p. 311; *Stuart Baker, ibid.* xx, p. 259 (1910); *B. L. Clarke, ibid.* xxii, p. 805.

Scelopax solitaria, *Seeböhm, Charadriidæ*, p. 475.

Vernacular Names. *Bon chaha*, Hindi; *Bharka*, Nepal; *Simpoo*, Khasia; *Daodidap gophu*, Cachari; *Boner kocha*, Assamese.

Description. **Adult Male.**—Crown black, spotted with rufous and with a narrow white median band often much broken up with brown. A broken supercilium narrowing behind the eye white, more or less mixed with brown. Loreal streak dark brown, more or less mixed with rufous. Chin, sides of head and throat white, speckled with dark brown and rufous, the centre of the throat almost pure white. Neck all round rufous-brown, much mixed with white below, darker and less mixed with white above, but having also dark brown or black bars. Back and scapulars black with numerous broken bars and spots of rufous, and the scapulars with broad white outer edges, in some cases tinged with rufous. Lower back deep brown with whitish tips and bars, rump with rufous spots, shorter tail coverts dark brown with rufous bars and longer coverts almost uniform olive-brown, rayed darker and with white bars at the tips. Median tail feathers black, tipped whitish and with a narrow black and a broad sub-terminal band of rufous; outer tail feathers irregularly barred black and white. Breast brown, more or less speckled and spotted with white which forms into broad bars where the breast and abdomen meet. Abdomen white, faintly barred at the sides;



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flanks, axillaries and under-wing coverts barred brown and white, the latter predominating. Under tail coverts white, sometimes practically unmarked and sometimes faintly barred with dusky brown and often with a faint rufous tinge. Wing coverts brown, speckled with rufous next the scapulars and elsewhere barred with rufous and black and tipped white; the edge of the shoulder is also barred with white; primaries dark brown edged and tipped with white, the edges broadest on the outermost quill and almost disappearing on the innermost; secondaries dark brown, tipped white, with frecklings of rufous and black, which in the inner secondaries become regular bars throughout the whole length of the feathers.

Colours of Soft Parts.—Bill greenish plumbeous, darkest at the tip, where it is almost black, and yellowish at the base of the lower mandible; iris dark brown; feet and legs pale yellowish plumbeous, the soles yellow ochre and claws horny brown.

“Bill plumbeous, black at tip, base of lower mandible yellowish brown; feet dull olive or pale yellowish green, the soles yellowish; claws horny black; iris dark brown.” (*Scully.*)

“The irides are dark brown; the legs and feet in adults are dull olive or yellowish-green, or greenish or dull pale yellow—in young birds ashy with a greenish tinge; the claws black or brownish-black; the terminal one-third of the bill is black or brownish-black, the basal portions generally yellowish-brown, bluish along commissure, but the upper mandible often has a greenish ashy or plumbeous or vinous or fleshy tinge, and sometimes is plumbeous everywhere except at the dark tip.” (*Hume.*)

Measurements.—“Total length 11 inches, culmen 2·9, wing 6·3, tail 2·3, tarsus 1·3.” (*Sharpe.*)

“Wing 6·25 to 6·8 inches, bill 2·52 to 2·87 (no male above 2·77), weight 5 ozs. to 8 ozs.” (*Hume.*)

Adult Female.—Similar to the male.

Measurements.—“Total length 11 inches, culmen 2·8, wing 6·0, tail 2·5, tarsus 1·3.” (*Sharpe.*)

“The sexes do not, judged by my measurements, appear to differ appreciably in size, but the three largest birds measured were females and the two smallest males, so that probably, age for age, if one could make sure of this, the females are the largest.” (*Hume.*)

Measurements of the specimens in the Bombay Natural History Society's possession and in the Indian Museum, together with a few others which have passed through my hands, do not show much variation in size between the male and the female. The average measurements for both sexes are, wing 6·41 inches (= 162·8 mm.), bill from gape 2·76 (= 70·1 mm.), tarsus 1·30 (= 33·6 mm.). The smallest bird, a female from the Indian Museum, has a wing of 6·02 inches (= 153·0 mm.) and the largest, an unsexed bird from the same place, has the wing 6·68 (= 169·6 mm.). The bills vary in length between 2·62 and 3·02 (= 66·5 and 76·7 mm.), and the tarsi between 1·12—that of a curiously short-legged bird—and 1·5 inches (= 28·4 and 38·1 mm.).

The depth of the bill at the extreme base is only ·32 inch (= 81·2 mm.) as against ·5 (= 12·7 mm.) in that of the Wood Snipe, and the length and slenderness of the bill of the Solitary Snipe is alone sufficient to distinguish it from the other. In general appearance the Solitary Snipe is a far paler coloured bird than any of the other snipe, and this difference is even more conspicuous in life than when the bird is made into a skin. In build it is also slighter, its neck longer, and it seems to stand higher on its legs, though its tarsus is really no longer than that of the Wood Snipe.

The British Museum has a fine series of this Snipe, over 40 specimens, but of these only 11 are sexed, 7 females and 4 males, and it is hardly safe to generalize as to comparative size of the sexes on such scanty material. It is, however, more than possible that a large series of sexed birds might show that the female Solitary Snipe is bigger than the male, a fact usual, indeed, with most known species of the genus *Gallinago*. An examination of those species of *Gallinago* of which the British Museum has fairly big series shows the following comparative measurements of males and females:—

			MALES					FEMALES	
			Bill	Wing				Bill	Wing
<i>Gallinago</i>	<i>stenura</i>	...	2·3	4·9	...			2·45	5·1
"	<i>megala</i>	...	2·3	5·4	...			2·6	5·6
"	<i>media</i>	...	2·45	5·55	...			2·5	5·3
"	<i>nigrigenis</i>	...	2·75	5·1	...			2·9	5·1
"	<i>gallinago</i>	...	2·8	5·2	...			2·8	5·3
"	<i>frenata</i>	...	2·8	4·9	...			2·9	4·7
"	<i>paraguayæ</i>	...	2·6	5·0	...			2·8	5·25

From the above we find that in the species *stenura*, *megala*, and *paraguayæ* both culmen and wing are longer in the female than in the male; in *media* and *frenata* the bill is longer but the wing shorter, but of the latter species there are only four females sexed out of the whole series; in *nigrigenis* the bill is longer and the wing the same and finally, in *gallinago* we have the bill the same and the wing longer in the female.

My own experiences go to show that both in the case of *stenura* and *gallinago* the female, though perhaps a less bulky bird, has wing and bill consistently though but slightly longer than it is in the male. At the same time, I have not had sufficient material to work on, as regards the other species, to enable me to assert that such is always the case with birds of this genus.

Distribution.—The Solitary Snipe is found throughout Eastern Asia from Japan as far west as the Altai Mountains and as far south as the Himalayas and the Chin Hills, extending further south during the winter into the plains of China and India.

As soon as the cold weather sets in the Solitary Snipe moves further south and to lower elevations, but it is in no sense migratory in India as the Woodcock is, seldom leaving the foot hills for the plains and only occurring in the latter as a rare straggler. On September 14th, 1879, Mr. A. Guthrie obtained a specimen near Benares, and in 1898 Mr. F. W. F. Fletcher and Mr. W. Hamilton shot a bird of this species near Devala in the S.E. Wynaad.

I have records of its occurrence in Cachar (W. Cathcart), Sylhet (St. J. Hickman), Dibrugarh, Chittagong Hill Tracts, Chittagong, N. Cachar, Khasi, and Garo Hills, and between October and March it undoubtedly occurs regularly in small numbers all along the foot of the Himalayas throughout the Doocars.

Harington records shooting one in the Bharno District, December, 1909. Venning says that it is not uncommon about Haka in the Chin Hills, and B. C. Clarke records ten Solitary Snipe being shot round about Quetta during the winter of 1912-13, mostly in the gardens round cantonments, and remarks that they had not been recorded at Quetta for forty years.

The extent to which the Solitary Snipe is migratory has been well worked out. In Japan it would appear that it is resident through-

out the year, perhaps working south during the cold season, but in China it is more truly migratory in its habits, breeding in North-Eastern Siberia and extending well into China in the winter. On the other hand in Turkestan, the Altai and possibly also Tibet, the bird is probably only locally migratory to the extent of altering the elevation of its haunts with the varying seasons.

The late Mr. H. E. Dresser, who had been working at this genus when my original article was written, very kindly sent me *in epistolâ* the result of his researches in regard to the distribution of this snipe.

"*Gallinago solitaria* breeds on all the mountain ranges of Asia between 57° and 27° N. lat.; also on the Commander Islands, in Kamchatka, Saghalien, Japan, the Corea, North China, Manchuria, Mongolia, Dauria, the southern half of the Irkutsk Government, the Bureja and Stanovoi Mountains, Sajon, the Altai Tarbagatai, Alatan, and the mountains of Turkestan at an altitude of from 4,000 to 14,000 feet, also in Tibet and the Himalayas. In the autumn and winter it is found near Irkutsk, Krasnojarsk, Ust Kamenogorsk, on the Irtysh, at Askabad and in Eastern Persia, where Mr. Zarudny obtained it on the 2nd of October, 1898, at Neizar in Seistan, on the 19th of October at Tebbess, on the 21st and 22nd of October at Kelata-Marg, on the 23rd of October at Pud-i-Akhangerun, and on the 31st of October at Kerat, all these places being in Seistan. The typical form is found in Turkestan, the Altai, the Altyn-Tag Mountains, Zaidan, the Southern Koko-Nor Mountains Nan-shan, Upper Goango, and South-Western Mongolia—the Eastern form (*Gallinago solitaria japonica*) from the Sayans, East to the Commander Islands, and south to Peking. Some specimens from Krasno Yarsk on the Yenesei are intermediate, whereas others belong to the Eastern form."

Nidification.—Within the limits of the Indian Empire the Solitary Snipe breeds throughout the Himalayas from Western Kashmir to the extreme east of Assam, both north and south of the Brahmaputra, and thence through the Chin and Shan Hills wherever these are of sufficient elevation. At this season it may be found at all heights between 15,000 feet and 9,000, probably breeding at a rather lower elevation than this, as I shot a specimen in May in N. Cachar at 6,000 feet. The testes of this bird were much swollen and it was evidently breeding either in the place where shot or in the adjoining Naga Hills which ran some 2,000 feet higher.

Hume records:—

"The breeding season commences in May. . . . The nest, such as it is, is usually placed on grass or moss, close to some stream, often more or less overhung by some tuft of grass or rushes. It consists at most of a few dead rushes or scraps of dry grass or moss, surrounding or at times lining a little depression in the moss, turf or ground. In one case I was told there was no nest at all, the eggs being laid simply in a circular shallow depression in deep, spongy club moss, apparently merely hollowed by the pressure of the bird's body.

"I have never myself seen a nest, but have this information from natives who have repeatedly seen the eggs, always at places high up on snow-capped ranges and on snow-fed streams.

"I have never succeeded in securing or even getting a sight of the eggs, though on one occasion several (subsequently unfortunately destroyed) were collected for me in Kashmir."

Oates has shown in his 'Game-Birds,' p. 442, that the eggs Mandelli obtained from Sikkim and believed to be those of the Wood Snipe, were almost certainly of this species. As regards these eggs, Herr Otto Moller gave Hume the following details:—

"The eggs were found in native Sikkim, just opposite Darjeeling. Mandelli several times pointed out to me the spur where they were found, the elevation of which is, I should say, between 8 to 9,000 feet. The eggs, eleven in number, were procured during the latter part of June . . . but the eggs, though clearly all belonging to the same species, equally clearly belonged to four different nests, and the men could not point out the clutch to which the skin belonged."

Hume describes these eggs as being broad ovals of a regular peg-top shape with stout compact shells, very faintly glossed. He adds:—

"The ground is a pale pinky stone colour of varying shades, sometimes almost white, sometimes browner, sometimes more decidedly pink, densely and boldly blotched (the blotches often longitudinal in their character and radiating in curved lines from the brown apex) with a rich, at times brownish, maroon, almost black in some spots, browner in some eggs, redder in others, this blotching being generally intermingled with very similarly shaped, sub-surface-looking pale grey or inky purple patches or clouds."

"In some eggs the markings are almost entirely confined to the upper one-third of the eggs, where they are in places all but confluent. In others the markings, though in such cases often less densely set, extend over the entire upper half of the egg; but as a rule

but few markings, and these much reduced in size, extend over the lower half of the egg."

"The eggs, I have measured, varied from 1'66 to 1'76 in length, and from 1'2 to 1'28 in breadth, but the average of ten eggs is $1'71 \times 1'24$."

They are by no means rare in the Gilgit Agency, and Major Haughton assures me that they undoubtedly breed there in some numbers.

Oates, in describing the eggs of the Solitary Snipe in the Collection of the British Museum, notes that "they are easily distinguished from the eggs of all other snipes in the Collection by reason of their pinkish-buff ground colour. . . . Many of the blotches are streaky and make an angle with the major axis, seeming to be, as it were, twisted round the egg from right to left, when the specimen is viewed with the broad end uppermost."

The Collection contains three of Mandelli's eggs, so the above reference to the pinkish ground colour may be considered applicable to those as well as the others and agrees with Hume's own description. The other Solitary Snipe's eggs in the Collection are two clutches from Ta-tran-la, Tibet, and were taken at an elevation of 12,000 feet.

In my own Collection I have a clutch of four eggs from Turkestan and a single egg from Issakul, the latter of which was given me by Lord Rothschild out of a clutch of four eggs in the Tring Museum. All the eggs have the drab-yellow ground colour and vandyke-brown markings of ordinary snipes' eggs with no trace of the pink tinge mentioned by Oates, and shown in the plate (III, No. 9) in the second volume of the 'Catalogue of Birds' Eggs in the British Museum.' All, however, have the same curious twisted character in the markings.

In 1908 Mr. W. P. Masson sent me two clutches of eggs said to be of this bird. I had then not seen any authentic eggs, and as no skin was sent with these I returned them, to my everlasting regret, for they were without doubt quite correct. They were exactly similar to those described by Hume and were most beautiful eggs, but they were in general shape more like hens' than snipes' eggs, being broad ovals rather than peg-top in shape, and had the pink tinge very highly

developed. Each clutch contained four eggs and was taken on the Singlo ridge above Darjeeling at an elevation of 10,000 feet or more.

During the breeding season the Solitary Snipe *bleats* or *drums* in much the same manner as does the Fantail. Hume observes :—

“In May . . . the males are often to be seen and heard in the higher portion of the hills soaring to a considerable height, repeatedly uttering a loud, sharp, jerky call, and then descending rapidly with quivering wings and out-spread tail, producing a harsh buzzing sound something like, but shriller and louder than, that produced by the Common Snipe, and this though they do not descend as rapidly as this latter.”

General Habits.—The Solitary Snipe is by no means a common bird anywhere within our limits, although Hume says that “in the Himalayas at all seasons it is at least ten times as numerous as the Wood Snipe. It is just as commonly met with in twos and threes as singly, whereas (in the hills at any rate) the Wood Snipe is always solitary.” Scully also reported that “the Solitary Snipe is not uncommon in the Valley of Nepal from October to the beginning of March, being represented in larger numbers than either the Woodcock or Wood Snipe.” As, however, Scully also says that the Woodcock “is not at all common in the Valley and can only be obtained by hard work,” we need not infer that the Solitary Snipe occurs in any great numbers.

This bird is in all its ways far more a true snipe than is the Wood Snipe, and in flight and voice is very similar to the Fantail and Pintail. On the wing it is strong and quick and it indulges in the same twists and turns as does the Pintail, rising with the same loud “pench” as does that bird, though its voice is shriller and louder, and its flight, perhaps, not so quick.

Hume says :—

“They do not seem to care much for cover. I have constantly seen them along the margins of little streams, in bare rocky ravines and valleys, where there were only small corners and nooks of turf and mossy swamp, and no cover a foot high. I have, no doubt, found them in small open swamps in the middle of jungle, but they stick to the grass and low rushes, and I never observed them in scrub or ringal jungle. I have known Wood Snipe and the Eastern Solitary Snipe flushed within a short distance of each other ; but, as a rule, the Wood

Snipe is to be seen only in tiny swamps or morasses, partly or wholly surrounded by thick cover—the Solitary Snipe in little swampy places on open, grassy hillsides or along the margins of rocky-bedded bare-banked streams.”

It however does sometimes actually frequent forest land, for one shot by Colonel Wilson in Shillong was found in grass land more or less covered with pine forest, and the breeding male shot by myself in North Cachar was put up out of bracken in oak forest, the trees being quite close together and much matted and covered with orchids and other parasites.

Such birds as I have records of as shot along the foot-hills of the Himalayas seem to have been all obtained from grass bordering patches of swamp, situated either at the bottoms of grassy hills or else in comparatively open ravines.

Colonel Wilson, writing to me about this snipe, says: “I have only killed about half a dozen of these in my time and all round about Shillong. I found them in the same sort of ground as the ordinary snipe and never in matted grass such as the Wood Snipe inhabits.

“On March the 13th, 1890, when shooting with Mr. W. H. Dobbie, I killed three Solitary Snipes all within a few yards of one another.”

Hume found, in the stomachs of those he examined, small insects and tiny grubs; in two or three were found masses of tiny black coleoptera and in one some minute shells. In the one bird I have examined there were numerous tiny shells and what looked like the remains of some grey-coloured caterpillars.

From the formation of the bill of birds of this sub-family one would expect to find them all more or less addicted to boring in the earth for their food. The bills of all Snipes are so constructed that by elevating the end of the maxilla, or upper mandible, they can be opened for about one-third of their length whilst the gape itself is still kept closed. This enables the snipe to thrust its bill into the soft ground or slush in which it feeds, and having found its prey, to grasp it without resorting to the great muscular effort which would be necessitated by an attempt to force open the whole bill from gape to tip.

Knowing this fact, an examination of the bill of each species may

be found to be some guide to help us to ascertain the food on which it principally subsists, for we shall find the nervous and muscular structure of the bill most developed in those species which resort most to boring in their search for food.

In *Gallinago solitaria* we do not find the retractile muscles and the nerves very highly developed and there are not the strong terminal pits which we see in the bill of the Common Snipe, and, to a lesser degree, in the Pintail and Woodcock. It is probable, therefore, that the Solitary Snipe feeds principally upon such insects and surface shells, &c., as it can obtain above ground, resorting to boring for worms and similar food only when forced to do so by the absence of any other.

The Solitary Snipe is a most excellent bird for the table, though, as Hume says, perhaps less so than some other members of the genus.

The Plate of the Solitary Snipe is decidedly good. Many birds are considerably paler in general tone than the bird depicted, which indeed, is darker than the average, though I have seen specimens even darker still. I doubt if any bird ever possessed quite such vivid green legs as these, and the greater number have them more a dull yellow-green with a distinctly livid tinge.

The bill is correctly coloured, except that the terminal third should be darker. It must, however, be remembered that though the brown tinge given here is correct for some birds, in many the bill will be found to be coloured a livid green at the base, more especially about the gape.

GALLINAGO NEMORICOLA.

THE WOOD SNIPE.

Scolopax gallinago, *Hodg. Gleanings in Science*, iii, p. 240 (1831) (*Nepal*).

Gallinago nemoricola, *Hodg. J. A. S. B.* vi, p. 490 (1837); *Blyth, Cat.* p. 272; *Jerdon, B. of I.* iii, p. 672; *Hume & Davidson, S. F.* vi, p. 459; *Hume, Cat. No.* 868; *Hume, S. F.* viii, p. 112; *Legge, B. of Cey.* p. 814; *Hume & Marsh., Game-B.* iii, p. 325; *Butler, S. F.* ix, p. 428; *Reid, ibid.* x, p. 68; *Ditmas, ibid.* p. 173; *Oates, B. of B.* ii, p. 385; *Barnes, B. of Bom.* p. 344; *Davison, S. F.* x, p. 413; *Hume, ibid.* xi, p. 318; *Oates, Hume's Nests and Eggs*, iii, p. 350; *Sharpe, Cat. B. M.* xxiv, p. 657; *Oates, Cat. Eggs of B. M.* ii, p. 64; *Sharpe, Hand-L.* i, p. 166; *Blanford, Avifauna of B. I.*, iv, p. 285; *Oates, Game-B.* i, p. 439; *Finn, In. Waders*, p. 141; *Stuart Baker, J. B. N. H. S.* xx, p. 270 (1910); *Bloech, ibid.* xxiii, p. 778 (1915); *Wait Spolia Zeylanica*, x, p. 236 (1916).

Scolopax nemoricola, *Jerd. Ill. Ind. Orn.* pl. ix; *Nevill, J. A. S. B. (Ceylon)*, 1867-70, p. 138; *Seebohm, Charadriidæ*, p. 474.

Description. Adult Male.—Forehead brown, changing to black on the crown and nape; a rufous median stripe; supercilium and sides of the head white, fulvous-white or pale fulvous, speckled with brown and with broad brown bands running from the lores and from under the ear-coverts to the nape. Chin white, generally unspeckled, sometimes faintly dotted with brown. Upper back and scapulars velvety-black, the former near the nape much marked with rufous and the latter broadly edged with the same; lower back and rump duller black with rufous bars, more or less whitish in front on the former; upper tail-coverts barred rufous and blackish-brown, the former colour predominating. Central tail feathers black with two rufous bars and tips, the sub-terminal bars very broad; outer tail feathers barred dull white and black. Breast fulvous, or fulvous-white barred brown; remainder of lower parts, *including the abdomen*, white barred closely with brown and with the under tail-coverts generally strongly tinted with rufous. Axillaries and under wing-coverts dark brown with narrow white bars. Wings brown,



THE WOOD SNIPE
Gallinago nemoricola
Life size

the coverts edged and barred with fulvous, the primaries and primary coverts tipped with a pale edging, inner secondaries barred throughout with fulvous or fulvous-rufous.

Colours of Soft Parts.—Irides dark-brown, bill horny-brown, more or less tinged with green, the tip darker and the basal two-thirds of the lower mandible yellowish; legs dark plumbeous green.

Measurements.—Wing 5·25 to 5·75 inches, bill from gape 2·4 to 2·65, tarsus 1·2 to 1·5.

Eliminating the largest and the smallest birds the tarsus only varies between 1·3 and 1·4 inches and the extremes both ways are probably abnormal.

Adult Female.—Does not differ from the male and is probably about the same in size or very little bigger, though with a longer bill. The two longest bills I have personally measured were 2·60 and 2·65 inches and both belonged to female birds.

Young Bird.—Judging from a single specimen of a young bird in the Indian Museum with a wing of 5·02 inches and a bill of 2·38 it would appear that in young birds the darker colours predominate over the paler more than in the adult. The dark bars on the lower plumage are distinctly broader and more close together, and the whole appearance in this specimen is far darker than I have seen in any adult bird.

Sharpe does not differentiate between the male and female, but the average measurements of the British Museum birds, including both sexes, are bigger than those I have handled. In the former the wing is given as 5·7 inches and the culmen as 2·65.

The depth of the bill in those I have measured averages about 0·5 inches, the heavy base being very conspicuous when compared with other Snipes' bills.

The sportsmen will generally be able to recognise the Wood Snipe by its comparatively dark plumage and rather squat heavy shape and beak.

Measurements.—"Length 11·0 to 12·5 inches, expanse 18 to 19·75, wing 5·4 to 5·7, tail from vent 2·5 to 2·9, tarsus 1·41 to 1·49, bill from gape 2·41 to 2·62, weight 4·9 to 6·1 oz." (Hume.)

Jerdon gives the weight as up to 7 oz. and Hodgson, amongst some twenty birds weighed, obtained one of 6·75 oz.

"The irides are hazel to deep brown; the fronts of the legs and toes are grey, sometimes, perhaps commonly, bluish, sometimes more plumbeous or slaty and sometimes again with a drabby shade, or again greenish, and generally everywhere paler in the female; the back of the legs and soles fleshy, sometimes pinky, sometimes bluish or dusky; the claws horny-brown to almost black; of the bill nearly the terminal one-third is brown to blackish-brown; the basal two-thirds much paler and with a tinge sometimes reddish fleshy, sometimes yellowish fleshy, some livid, sometimes drab." (*Hume.*)

Distribution.—Blanford thus defines the distribution of the Wood Snipe within our limits, outside of which it has not yet been obtained.

"In the Himalayas as far as Dalhousie to the westward and Sikkim to the east, and probably further in the latter direction: also in the hills south of Assam and in Manipur, occasionally in Burmah even as far south as Tenasserim, and as a winter visitor only, in the hills of southern India—Coorg, Wynaad, Nilgiris, Anaimalais, Shevroys and probably others. In one case this species is said to have been recognised in Ceylon" [but Wait considers this a doubtful record]. "A very few specimens have been obtained whilst migrating, one at Calcutta by Blyth, two at Russelkonda by Macmaster, one in Serguja by Bull, and probable occurrences have been recorded at Nasik and Dharwar."

The Wood Snipe extends all along the Himalayas from the eastern point mentioned by Blanford, and I have had either records of its occurrence or specimens sent me from the Dooars, Buxa, Jalpaiguri, Barpeta (south of Bhutan) and Tezpur (south of the Dafia Hills), Cachar, Sylhet and Myitkyina (Capt. Clifford), thus linking up its range almost from point to point.

There is in the Society's collection a specimen of a Wood Snipe (in spirit) shot at Thana near Bombay by Mr. Thos. H. Moore, in January, 1896.

Nidification.—There is nothing on record about the nidification of the Wood Snipe at present except in connection with the eggs obtained by Mandelli in Sikkim. Three of these eggs are in the British Museum, but one of them is marked "869 *Gallinago solitaria*, native Sikkim, 18-6-79" and, as Oates remarks, it seems possible that Mandelli's reputed eggs of the Wood Snipe were afterwards

discovered to be the eggs of the Solitary Snipe, probably by the identification of a skin.

At the same time it must be noted that Hume distinctly states that when Mandelli's collectors brought in these eggs they brought in with them the skin of a Wood Snipe. The date and name on the eggs, however, would seem to show that this skin afterwards proved to be that of a Solitary Snipe.

My own experience, meagre as it is, as regards their nidification, would appear to confirm Oates' opinion. On the 11th June, 1908, one of my Khasia collectors brought in to me a Wood Snipe together with a single egg and some fine tangled grass, which he said had composed the nest and which was clogged and matted with the contents of other eggs which had been broken by the trapped bird. Unfortunately the egg which was saved is undoubtedly an abnormally small one, and my collector informed me that when he set the nooses for the bird he saw that there were three big eggs and one much smaller, but that in colouration they were all alike.

The single egg measures only 1.5×1.04 inches and is much like many eggs I have seen of *Gallinago gallinago* but is unusually grey-brown in tint. The ground is a pale stone colour and the markings consist of heavy blotchings of vandyke brown with a few underlying ones of grey or lavender. The smaller half of the egg is but very sparsely marked, but on the larger third the blotches form a deep dark ring, inside which again the markings are numerous but not confluent.

The texture is fine and smooth with a faint gloss and the shape is the ordinary sub-pyriform shape of most snipes' eggs.

Hume, writing of the breeding of this snipe, writes :—

“That they breed in the Himalayas between elevations of about 7 and 10,000 feet (and perhaps, though I doubt it, considerably higher) is certain. That they begin to lay early too is probable. Hodgson notes that on the 10th March the eggs in the ovary of a female were swelling, and another shot early in April contained a nearly full-sized but unshelled egg. But no European, I believe, has ever yet taken the nest, though Mr. A. G. Young writes that he *knows* they *do* breed in Kulu.”

It is more than probable that we shall eventually find that the

Wood Snipe breeds at far lower altitudes than 7,000 feet. The nest brought to me was taken near Shillong at 4,000 feet, and in Manipur it is almost certain that they breed at but little over 2,000 feet, whilst it also seems possible that they are permanent residents at the foot of the Himalayas throughout the Dooars.

General Habits.—As regards these birds' visits to the southern hills these are, no doubt, more or less the result of a migratory movement but as we get to know more about this rare snipe it will probably be found that its migrations are of a very local character and it would not surprise me to find that over the greater portion of its habitat it is a permanent resident. The dates on which specimens of the Wood Snipe have been obtained for me, show that it is not a bird of high elevations alone, and that in some cases it almost certainly breeds well below 2,000 feet.

From Jalpai I have received a bird shot in May in the swamps at the foot of the Hills; my father E. B. Baker, shot several specimens in Purnea and Maldah in April and May whilst returning from tiger shoots, and Colonel Wilson records his seeing many of these snipe in May in Manipur at about 2,000 feet elevation.

It is quite possible that if we knew the haunts of this snipe and if we could visit them at the proper season we should not find it nearly as uncommon as it has been hitherto considered.

Damant said that he found it common in Manipur and that one morning he killed five, shooting in long grass from the back of an elephant.

Whympere records: "I have seen Wood Snipe in the Dehra Dun Valley where I have shot them in December and put them up in Tiger beats as late as the 4th April. On one occasion I put up six in very heavy grass jungle of which we dropped three but only picked up one. This was in February."

Baldwin also came upon a number together when shooting in the Pilibhit District in January, 1872. He writes:—

"I came across not one, but over a dozen of these birds; they were close to one another . . . we soon put up several Common Snipes, and presently my companion fired at one, and I then saw a large dark bird, which I thought at the time was a Solitary Snipe, rise up with a croak, and, after curving about, drop close by. We

went up, and not one, but three rose—two of which fell to our shots, and did not rise until the elephants were close on them. They were particularly fine gamey birds, and proved most excellent for the table.”

Colonel Wilson has been good enough to send me copies of his notes on this bird as found in Manipur, and these I quote *in extenso*.

“The only time I ever made what may be called anything like a bag of Wood Snipe was in the year 1896 close to Manipur. I was sent out into cholera camp in May, and while there discovered a valley about four miles from our final camp, which seemed absolutely crawling with Black Partridges, and where also I saw many Wood Snipes. The Gurkha, as is well known, is an extremely keen shikari, and, unfortunately, one regardless of the breeding season. I accordingly issued orders that no one was to fire a shot in this valley till I could shoot it myself. In October of the same year I managed to get away. The following is a copy of an entry in my shooting diary:—

“October 1st, 1896: Went over to the Choonbutti (there was an old Manipuri lime kiln, near which we camped, in my reserved valley) with H— of my regiment; we did not find nearly so many partridges as I expected, and the grass was very heavy, still we killed fifteen brace of black partridges, $5\frac{1}{2}$ couple of snipe, of which $2\frac{1}{2}$ couple were Wood Snipe, and one quail. The grass was so stiff the dogs rubbed their noses sore.

“October 2nd: $22\frac{1}{2}$ brace of Partridges, $8\frac{1}{2}$ couple of snipe, of which four couple were Wood Snipe.

“We could have killed a good many more Wood Snipe had we troubled to go after them, but if a bird flew out of the line we were beating, we never followed it up, as we wanted to make a really good bag of partridges,

“These birds were all lying in heavy grass up to our knees.

“I think the name of this bird is somewhat of a misnomer, because out of those I have shot, a fair number, I have never once flushed one in a wood—though once I flushed one in a jheel in the midst of tree jungle, and he pitched in the forest, and I killed him there.

“The Wood Snipe lies in cover which is too thick for the ordinary snipe to run about in, and he also sometimes favours very high grass. The places he seems to like best are valleys in the hills, which are full of thick matted grass growing on the sites of old rice khets.

“He lies very close, and is consequently rather difficult to flush even with a dog, and when flushed flies heavily and seldom goes more than a couple of hundred yards.

“Occasionally when flushed he utters a croaking sound, which sounds like ‘Tok-Tok.’”

The Wood Snipe obtained by my father in Purnea and Maldah were shot by him in 1882 in company with Mr. J. Shillingford, Mr. G. Hennessy, and others, during a couple of tiger shoots held in April and May in the two districts.

My father told me that one day late in April when coming back from a successful tiger shoot in Maldah the line was engaged in shooting anything that might get up before the elephants as they wended their way home to camp. In this way a few hog deer and various birds were added to the bag, and whilst going past a number of tiny swamps covered with dense sun grass, one of the line put up and dropped a bird he thought to be a Woodcock. On search being made for this, several more were put up and a good many shot, my father himself securing four. Further on the same evening, whilst working through similar places, others were disturbed and two more shot, and following days yet others were brought to bag.

The same year and in the succeeding month, May, whilst shooting in Purnea a similar experience was met with and more of these birds killed. I cannot now remember what was the actual number brought to bag, but from what my father told me they must have been fairly numerous, especially in Maldah.

He described the birds as being very slow and *owlish* in their flight. They rose with a low croaking cry, fluttered heavily over the grass and ekra in a fitful and undecided manner and then flopped into cover again before they had covered a hundred yards.

The Wood Snipe, not only in appearance but in flight and habits, is far more like the Woodcock than is the Solitary Snipe. It may not perhaps haunt forest and brake as does the Woodcock, but on the other hand it is never found in the short grass and open swamps frequented by the Solitary Snipe. Its favourite haunts seem to be those described above by Major Wilson or, when in the plains, huge fields of dense sun grass, ekra or elephant grass, which have in their midst small pools and swamps hidden away by the rank vegetation. In Maldah and Purnea they were found in tiny pools only a few yards across, which were covered with coarse weeds and grass so high and dense that they would have been unworkable except from elephants.

In flight, as may be seen from the descriptions already given,

it closely resembles the Woodcock and is, perhaps, even slower. It pursues the same wavering, bat-like course in its mode of progression, makes the same unlooked-for darts to one side or the other, and finally, has the same headlong tumble into cover, giving one the idea that it has died suddenly and fallen to earth.

It is, however, a very shy retiring bird, and never like the Woodcock frequents the haunts of men. This shyness and also the unhealthiness of its habitat along the Terai will probably always prevent us learning very much about it.

The Plate of the Wood Snipe is excellent, both in colouration and attitude. In many birds the bill has a faint green tinge about the base, but normally, I think, the colour is much the same as that of the plate, though perhaps not quite so clear and hard as there depicted.

The legs and feet are very well coloured, but the colouration varies much and is often just as distinctly greenish as they are here shown bluish.

The attitudes of the birds in this plate and that of the Solitary Snipe show well the characteristics of the two species; the active, quick-moving character of the Solitary Snipe, as compared with the heavy, slow disposition of the Wood Snipe.

Genus GALLINAGO.

GALLINAGO GALLINAGO GALLINAGO.

THE COMMON OR FANTAIL SNIPE.

Scolopax gallinago, Linn. S. N. i, p. 244 (1758); Seebohm, *Charadriidæ*, p. 484; *Id. B. Jap. Em.* p. 346.

Scolopax sabinii, Vigors, *Trans. Linn. Soc.* xiv, p. 557; Barrett-Hamilton, *Irish Naturalist*, Jan. 1895.

Gallinago scolopacina, Blyth, *Cat.* p. 272; Jerdon, *B. of I.* iii, p. 674; Godwin Austin, *J. A. S. B.* xxxix, p. 273; McMaster, *ibid.* xl, p. 215; Blanford, *ibid.* p. 276; Hume, *Nests & Eggs*, p. 586; *Id. S. F. I.* p. 235; Adam, *ibid.* p. 395; Hume, *ibid.* ii, p. 295; Parker, *ibid.* p. 335; Hume, *ibid.* iii, p. 182; Blyth, *B. of B.* p. 156; Blanford, *East Pers.* ii, p. 282; Butler & Hume, *S. F.* iv, p. 15; Scully, *ibid.* p. 186; Fairbank, *ibid.* p. 439; Hume & Dav. *ibid.* vi, p. 459; David & Wen. *ibid.* vii, p. 88; Ball, *ibid.* p. 228; Legge, *B. of Cey.* p. 821; Murray, *Vert. Fauna Sind.* p. 240.

Gallinago gallinago, Sharpe, *Cat.* xxiv, p. 633; *Id. Hand-L.* i, p. 165; Oates, *Game-B.* ii, p. 455; *Id. Cat. Eggs B. M.* ii, p. 61; Stephens, *J. B. H. N. S.* xxiii, p. 729; Gyldenstolpe, *Swedish Ex. to Siam*, p. 147 (1916); Wait, *Spolia Zeylanica*, x, p. 237 (1916).

Gallinago gallinaria, Cripps, *S. F.*, vii, p. 302; Hume, *ibid.* viii, p. 70; Bingham, *ibid.* p. 196; Scully, *ibid.* p. 225; Butler, *Cat. B. of S.* p. 61; *Id. Cat. B. S. Bom. Pres.* p. 76; Vidal, *S. F.* ix, p. 84; Bingham, *ibid.* p. 196; Reid, *ibid.* x, p. 86; Barnes, *B. of Bom.* p. 345.

Gallinago cœlestis, Hume & Marsh. *Game-B.*, iii, p. 359; Butler, *S. F.* ix, p. 428; Barnes, *ibid.* p. 459; Davidson, *ibid.* x, p. 320; Hume, *ibid.* p. 413; Oates, *B. of B. B.* ii, p. 381; Hume, *S. F.* x, p. 413; *Id. ibid.* xi, p. 321; Blanford, *Avifauna, B. I.* iv, p. 286; Finn, *In. Waders*, p. 144; Bahr, *P. Z. S.* p. 12; Butler, *J. B. N. H. S.* xii, p. 427; Stuart Baker, *ibid.* p. 501; Wilson, *ibid.* p. 641; Ratray, *ibid.* xvi, p. 695; Stuart Baker, *ibid.* xx, p. 547 (1911); Bloech, *ibid.* xxiii, p. 778; Stoney, *ibid.* xxiii, p. 779; Williamson, *J. N. H. Siam*, i, p. 48; Barton, *ibid.* i, p. 109; Gairdner, *ibid.* i, p. 152; Stoney, *J. B. N. H. S.* xxv, p. 306 (1917).

The Snipe, the *Times*, 26th December 1908, and 27th August 1909,

Vernacular Names. *Chaha* or *Chaha chiriya* (Hin.); *Chegga*, *Khada-Kocha* (Bengali); *Kocha Sorai*, *Chaha-Sorai*, *Chergyia* (Assamese); *Bharak* (Nepal); *Chek-Lonbi* (Manipur); *Myay-Woot* (Burm.);



THE COMMON or FANTAIL SNIPE

Gallinago p. gallinago

— Temm.

THE JACK SNIPE

G. gallinula

—

Chaha-Charai (Ooriya); *Tibud*, *Pan-lawá* (Mahr); *Mor-Ulan* (Tam.); *Muku-puredi* (Tel.); *Keswatuwa* (Cingalese); *Dao-didap* (Cachari); *Vok-ti-alin* (Kuki); *Ti-inrui* (Naga); *Ye-gnon* (Chindwin); *Pazimbon* (Kyanksé, Kachin Hills).

Description. Adult Male.—Crown to nape dark brown or blackish-brown, with a few specks of pale rufous; a broad median stripe and broad superciliaries reaching back to the neck pale rufous; a line from the bill through the eye and over the ear-coverts dark brown; sides of the head rufous speckled with brown; neck rufous blotched with brown and with two fairly definite lines of brown on lower throat and neck; chin and upper throat plain unspotted rufous. Back velvety-black, the scapulars with broad, pale rufous edges, which form a longitudinal line down each side of the back. Upper back much speckled and barred with rufous, lower back barred with pale rufous; upper tail-coverts rufous barred with wavy lines of black and with obsolete shaft streaks; tail black with narrow bars and a broad terminal band of rufous. Lesser wing-coverts brown, tipped rufous, median coverts barred with rufous and brown, and greater coverts brown with white tips. First primary brown with white outer web, other primaries brown with narrow white strips, increasing in width on the innermost; secondaries barred brown and black, and mottled with white on the inner web. Breast dull buff or brownish, with dark brown bars; flanks the same; abdomen white; under tail-coverts rufous or buff and brown, the former colour predominating. Lesser under wing-coverts white, much barred with brown, principally so on the edge of the wing; median under wing-coverts white, seldom with any barring at all; greater coverts brown with a broad white edge; axillaries white more or less barred with brown.

Colours of Soft Parts.—"Bill rufous-brown, paler at the base; irides deep brown, legs olive-green. Tail feathers 14 or 16 in number." (*Blanford.*)

"The bills have the terminal one-fourth or more deep brown to blackish; the rest pale brown or horny-brown with a yellowish tinge, dark along the edges, often brownish-green just at the base of the upper mandible, and generally yellowish, yellowish-green, or olive on the basal fourth (more or less) of the lower mandible; the irides are deep

brown, almost black; the legs and feet are ordinarily greenish, often pale olive-green or greenish-olive; and as the season advances they acquire a stronger yellow tinge, the legs of birds killed in April and May being often a distinct yellow-green; there is often a dusky shade over the joints, and the claws are deep brown to black." (*Hume.*)

Measurements.—"Length 9·0 to 10·3 inches, expanse 15·0 to 17·5, wing 4·9 to 5·6, tail from vent 2·5 to 2·9, tarsus 1·20 to 1·34, bill from gape 2·39 to 2·67, at front 2·43 to 2·75, weight 3·3 oz. to 5·1 oz., average 4·15 oz." (*Hume.*)

Adult Female.

Measurements.—"Total length 10·5 inches, culmen 2·8, wing 5·3, tail 2·45, tarsus 1·3." (*Sharpe.*)

The female does not differ from the male in colouration, but is a rather larger bird.

"In this species also the females do average slightly larger and have longer bills than the males.

"Length 9·2 to 12·5 inches, expanse 16·0 to 18·25, wing 4·9 to 5·71, tail from vent 2·3 to 3·0, tarsus 1·25 to 1·33, bill from gape 2·5 to 2·9, at front 2·62 to 3·0, weight 3·1 to 5·5 oz., average 4·27 oz." (*Hume.*)

Mr. Stoney (in *loc. cit.*) gives the average weight of 135 Fantails of both sexes as 3·513 ozs., which is a great deal less than Hume's, but his weights appear to have been taken in the early part of the year, when young and light birds would naturally have been rather in excess. Later, in 1917, he has given further notes on the same subject, and from these it would appear that the average weight of 308 birds weighed by him in 1914-15-16 was only 3·34, a trifle lighter still. The weight of two exceptional birds he gives as being 5 and 5½ ounces respectively.

Captain A. Boxall records shooting a snipe weighing 7 ounces at Bangalore.

"Young.—Differs from the adult in being more rufous, especially on the throat and neck. The black markings of the back are more broken up and mottled with rufous bars, and the pale outer bands along the scapulars are not so wide." (*Sharpe.*)

Nestling.—Pale fawn tinged with rufous above and fading almost to white on the under parts. Upper parts mottled with deep brown,

or blackish-brown; wing with two dark bars and head with the orbital streak and bars on the head well defined.

The above description is taken from a Cashmere nestling, and nestlings from England appear to be brighter and more chestnut. All nestlings have tiny silvery tips to many of the feathers.

There is a form of the Fantail which has been honoured with a separate name and called Sabine's Snipe (*Gallinago sabinii*) but which is now recognised by all ornithologists as being merely a melanistic form. The home of this is in Ireland, whence specimens extend to England in some numbers, one also having been obtained in Scotland and one on the Continent. In the 'Irish Naturalist' for January, 1895, Barrett-Hamilton has written an article on Sabine's Snipe in which he accounts for no less than 55 specimens, of which 31 were obtained in Ireland and 22 in England. The only record of its occurrence in India is made by Finn in his "Indian Waders," in which he says, "a fresh specimen of a snipe was brought to me for identification, which was an undoubted example of this form."

A comparatively far more common variation in India is the pale form; one cannot call them albinistic as they are not true albinos. Even this, however, is very rare. Mr. W. K. Dods, who has shot many thousands of snipe, has never obtained one, and in thirty years' shooting in India I have been no more lucky.

The Indian Museum has five specimens of this pale Snipe. They are all of a very pale fawn, almost white, ground colour, and have the usual markings, but all of a pale fawn or rufous-fawn tint. With the exception of one bird all have the bill and feet normally coloured, and one bird has also some normal feathers, on the upper plumage, which are new, showing that it would probably have moulted into the ordinary plumage.

There is one specimen with pale feet and bill, probably therefore truly albinistic, but the colour of the irides is not mentioned on the ticket.

In addition to the above specimens there is one which has part of its plumage dark and part pure white; even this, however, is not true albinism, as the bill is dark as well as the feet, and the white plumage is most probably due merely to some injury.

In the possession of the Bombay Natural History Society there

are yet three more of these pale Snipe, but one of them has numerous feathers on the back and scapulars with normal coloured patches upon them, and the tail also is practically normally coloured; this bird, which was obtained by Major Harington in March, 1896, at Meerut, is in full unabraded plumage, and it is impossible to say whether it is in course of losing its colouration or commencing to re-acquire it.

A fourth, and far more interesting specimen, is one sent by Mr. N. Z. Nicholas from Sind. In general plumage this is the palest bird I have seen, but the median and greater wing-coverts are normal, as are the quills and under-surface of the wings, including the axillaries. This probably is a specimen which had originally lost its colouring through shock or injury, and is now gradually recovering. The feet of this bird are distinctly dark, and the beak also appears to have been so in life.

There is a very beautiful specimen of the Fantail in the Indian Museum, recently presented by Messrs. Manton and Co., and procured in the vicinity of Calcutta, which is of a still more rare form than either the pale or melanistic variety. From this bird every atom of red colouring has been eliminated, and the consequence is that the whole plumage consists of various tones and shades of grey, ranging from pure white on the under parts to the deep velvety black of the scapulars. The bird as a whole gives one the impression of being a lovely dark silver grey.

The cause of this bird's colouration is undoubtedly the exhaustion of the rufous colouring pigment. The question of pigmentation as applied to plumage is still in its infancy, and it is not easy to lay down the law on the subject with our present scanty knowledge. Our piebald Snipes and other birds generally have the white plumage caused by some local injury which completely checks circulation of all pigment to the part injured; on the other hand, the uniformly pale fawn Snipe appear to have lost the power of generating the dark pigment and to have their rufous pigment deficient as well. Sickness in many birds causes loss of brilliance in colouration, and in some cases actual loss of colour, heat with humidity increases depth and brilliance, and a dry sun combined with open country causes excessive evaporation and consequent bleaching.

Colonel G. H. Evans records having seen five so-called white

Snipe in Burmah, three shot by himself, one shot by a Colonel Eyre, and one shot by Mr. W. Perry.

Distribution.—Sharpe, including *raddei* with his *cælestis*, says that its distribution is Europe generally and Northern Asia up to about latitude 70°, migrating south in winter to Senegambia, N. E. Africa, India, and the Malayan countries, as far as Batchian. It occurs in Greenland, but only occasionally in North America, and is accidental in Bermuda.

Within our limits there is no portion of the Indian Empire from east to west and north to south in which the Common Snipe will not be found provided there is suitable country for it. It is, however, less numerous to the extreme south, and is less common in the north-east than is the Pintail, and is rare in Southern Burmah, but straggles into Malaya, and in 1907 I received a specimen from Siam, whence it had not previously been recorded. Gyldenstolpe, however, records the Common Snipe as occurring plentifully in Siam, though in smaller numbers than the Pintail. This is corroborated by the observations of both Gairdner and Williamson. Major Venning informs me that he has repeatedly obtained it in the Chin Hills.

Nidification.—There is very little on record about the breeding of the Common Snipe within Indian limits, although it breeds throughout the Himalayas at suitable elevations, and doubtless will also be found breeding in the highest ranges of the Kachin and Shan Hills where there is any suitable country for it.

Mr. Bloech, in the notes already referred to, says, that he feels sure, that in Burma Snipe sometimes remain to breed, and remarks that he has "shot on several occasions early in the season quite young birds with plumage not sufficiently developed to enable them to travel any distance: besides, these birds were in excellent condition, whereas the first arrivals in August are always on the light side."

Brooks heard it drumming over a swamp in Kashmir, where it doubtless had its nest, and Hume records that "numerous eggs have been collected by native collectors." "The nests found in Kashmir were described as cup-shaped hollows in soft, mossy, spongy turf, surrounded or overhung by rushes and grass, and sparingly lined with fine grass, and in one case with the needle-like leaves of a horse-tail (*Equisetum*.)

"The birds do not apparently commence laying in Kashmir until May, and much incubated eggs have been found late in June."

Wilson, Whympers, Rattray, Buchanan, Ward and others, have since taken its eggs in Kashmir and the Himalayas.

The first named records that he

"Came across about six couples of these birds on the Sambul Marsh. We found several of the nests, but two only contained eggs. The nests, placed in the centre of a clump of thick grass or bracken, were shallow cups of dried coarse grass without any lining of any kind. We put the bird off the nest on two occasions. The first nest contained four beautifully fresh eggs and the second two. One of these eggs was fresh and the other broken and badly addled! though the snipe never left the marsh during our search, we heard nothing of the drumming noise, but on several occasions noticed a bird hovering over its nest before settling."

I have two clutches of eggs of the Fantail Snipe which were taken in the Santhal Parganas. My general bird *factotum*, skinner, egg collector, &c., in this district was a Mahomedan, who had lived all his life in the district, and was more Santhal than Mahomedan in his ways, and, like most Santhals, was a keen field naturalist. Shooting snipe one day with this man, he told me that a few bred every year in the ravines between the hills adjoining the Suri Road. I paid little attention to his story, and thought that he was referring only to the Painted Snipe, but that same year he brought me a clutch of four eggs which were plainly snipes' eggs, and later on found another nest which I visited, taking the eggs with my own hand and shooting the bird as it left the nest.

Both these nests were placed at the foot of thinly foliated bushes standing in tiny swamps between low hills. The bushes themselves were so bare that they hardly screened the nest, but there were a good many tufts of grass, and these had to be pushed on one side before the nest was visible. This, the nest, was composed entirely of a fine curly brown grass which formed quite a soft bed for the eggs to lie on. It measured only about four inches across and the centre of the depression was possibly an inch deep. The one I saw myself lay in a small hollow, which was probably made in the first place by the foot of some hoofed animal.

Blanford, who, however, makes no distinction between *gal-*

linago and *raddei*, thus defines the breeding range of the Fantail Snipe:—

“The Common Snipe breeds throughout the greater part of Europe, Central and Northern Asia, but chiefly between latitudes 50° and 70° North.”

The eggs of the snipe are normally always four in number and are pyriform in shape, but less markedly so in some cases than in others.

The ground colour varies from a pale grey-green, grey stone colour, or yellowish stone colour to a comparatively dark olive-grey or olive-brown, in some cases the brown being dominant and appearing to be almost a pure though pale vandyke brown.

The markings consist of large irregular blotches, spots and dots of rich brown, often almost black and rarely with a purple tint. Secondary to these are similar markings of pale grey, lavender or purplish brown. These are scattered to some extent all over the surface, but, as a rule, they form a broad ring or cup at the larger end, where they are almost invariably more numerous than elsewhere. In a few eggs a twisted line of deep brown may be found at the larger end, but this is exceptional.

In some eggs the markings are much elongated and are so disposed as to give the idea of having been laid on whilst the egg was being twisted, the trend of the blotches being distinctly spiral.

The texture of the shell is smooth and close, and the surface fairly hard, in some cases with a decided gloss.

They are very large for the size of the bird, and Seebohm gives the measurements as between 1·5 and 1·65 inches in length and 1·05 to 1·25 in breadth. Oates gives the greatest length and breadth as 1·72 and 1·22 inches respectively, and Dresser the average length as 1·61 inches.

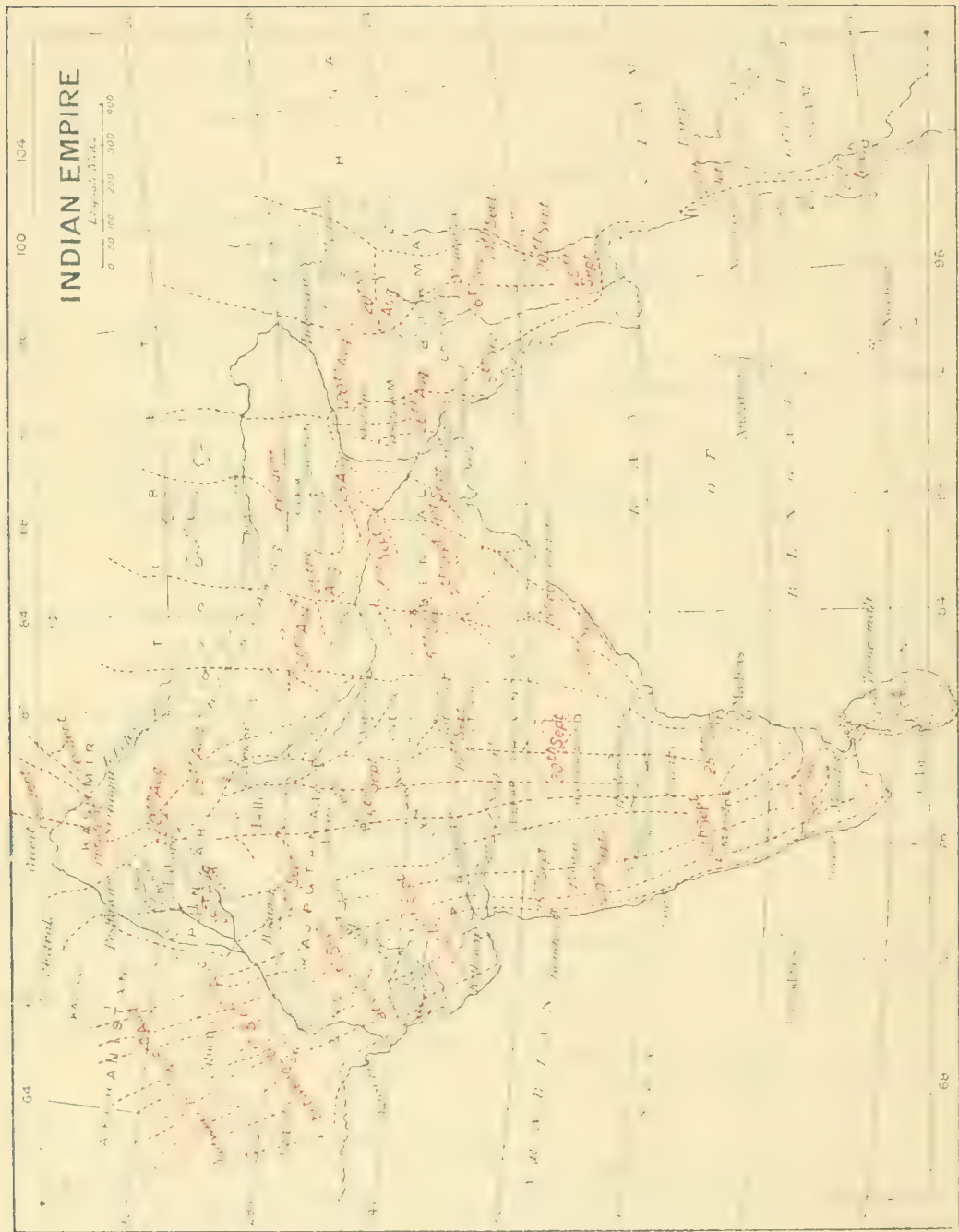
In the southern part of their usual breeding range, the Common Snipe begins to breed in early April and throughout May, but in the more northern latitudes it does not commence to lay until June, and eggs have been taken well on into July. In the Himalayas I do not think it breeds before May, and I have eggs taken in June.

General Habits.—Although the Common Snipe has a breeding range which, if one includes Radde's Snipe, extends completely across Asia, yet migration into India undoubtedly takes place to a

far greater extent from the west than the east, and it would appear that eastern birds do not as a rule penetrate so far south as the western. A certain number of Fantails do yearly come into India *via* the great rivers of the east, such as the Dihong, Dibong, Brahmaputra and Irrawaddy, but a far greater number come *via* the western rivers and passes.

As a matter of fact it is not at present at all certain whether in their annual migrations snipe, either Fantail or Pintail, do make use of the great water-ways and, personally, I am rather inclined to believe that such is not the case. Were it so we should expect to find snipe on their first arrival most numerous in those swamps and rice-fields which are situated close to the exits of the big rivers from the hills; but they are not so found, and though I have served some twenty-five years in the hills and plains of Assam, my experience goes to prove the contrary. Thus during the seasons of migration snipe are comparatively common in the Khasia Hills wherever there are swamps over 5,000 feet. These hills are situated on the south bank of the Brahmaputra, and all these birds must have come straight across the river instead of working along it, and thus skirting the hills. In the North Cachar Hills, I repeatedly found snipe passing the day on lofty peaks, arriving before daybreak and leaving in the dusk of the evening. Every year in August and in March and April snipe were to be found on the Guilang Peak, lying up in the ditch which surrounded the small Fort, this peak being almost 4,000 feet high. At Hangrum, over 6,000 feet, the same thing occurred, and once in early August snipe were found absolutely swarming in some scrub jungle on a hill slope just outside the rest-house. The birds were very thin and very tired, and so loath to rise that they were easily killed with dust shot and half charges of powder. Again all through the Assam Valley snipe appear to work due north and south and not east and west along the course of the Brahmaputra, and it seems probable that in migration snipe and many other waders instead of following the courses of the great rivers work straight across them, from one range to another.

The Fantail Snipe seldom arrives in India until August has well advanced, and even then it will only be found in the extreme north. By early September it has worked as far south as Central



MIGRATION ROUTES OF THE FANTAIL SNIBE (*GALLINAGO GALLINAGO*)
WITH APPROXIMATE DATES OF ARRIVAL.

Bengal, Bombay and the north of the Central Provinces, but it is not found in any numbers until the middle of that month, and it does not usually appear in Madras and Travancore until the end of September, and more often still not until the middle of October. Major E. O'Brien records seeing snipe at Palander on the 27th September (1917), and seems to consider that date exceptionally early, and writing from Coorg, Major J. C. Macrae informs me that the first snipe shot in 1908 was on the 14th September, and in 1909 on the 18th September. Oates long ago wrote "the Fantail does not appear" [in Burmah] "until the cold weather is well in, say, December," but I have records now of birds shot in Southern Burmah as early as September 25th.

On the other hand Colonel G. H. Evans writes that "the usual snipe season in Lower Burmah is from, say, the 20th August till end of October or early November" . . . "in Upper Burmah the season is from November until end of February, but . . . I have seen enough snipe at the end of April to afford a good day's shooting," and later he says that he has frequently seen odd birds as late as the middle of May.

Again Mr. E. O. Bloech gives the 13th August as the average date of arrival of snipe in the neighbourhood of Rangoon, but does not say whether his notes refer to Pintails or Fantails.

In Eastern Assam sportsmen generally try for snipe on the 4th August, and this is the earliest date upon which I know of a Fantail having been killed, but after this there is a long gap, and the next earliest was shot on the 26th August. Mr. L. W. Middleton shot a few Fantail in 1909 at Gauhati on the 5th September; at Chittagong a few are annually shot before the end of August, but all that I have *seen* shot there in this month were Pintail, and the Fantail must be a *rara avis* before September. In Bengal one *hopes* for Snipe on the 1st September, but does not always get them even at a latitude as northern as Calcutta, and many a hot and weary trudge have I had on the first two or three days of September without a chance of firing a shot. In Southern and Central Bengal there are but few birds in before the middle of the month.

Reid says that "the Common Snipe begins to make its appearance towards the end of September," near Lucknow.

Doig records their arrival on the Eastern Narra in September. Maitland notes the first snipe shot at Jacobabad on the 28th August, while Mr. C. O. Lowsley records the first snipe round about that place as early as 23rd August. Mr. A. Hosken shot four snipes near Secunderabad on the 26th August, and Theobald says that they do not arrive in Southern India until October.

As one would expect, the further south the birds go on migration, the earlier in the hot weather their departure takes place. Thus in Ceylon they leave in early March, and in Western India, Travancore and Madras most birds have left by the end of that month, though a few stay on well into April, and Hume says that individuals are to be seen "in the North and South of India in May and June." In North-eastern India I think few birds stay after the middle of April, but a few are shot now and then even in May. In 1882 I shot three Fantails on the Haripal Bheel near Calcutta on the 24th May; in 1871 Baldwin shot seven, and saw many more, near the village of Goovsora in Lablatpore on the 2nd May.

In the 'Indian Field' of the 12th May, 1904, a correspondent records shooting snipe up to the 3rd May, and "Raoul," in the same paper of the 26th July, 1909, also records shooting a snipe on the 3rd May.

Captain F. L. Hughes of the 20th Punjabis writes me that he has flushed a snipe in Jhelum on the 20th May, 1910.

A few birds stay all the year round in the plains, but these do not number one in every ten thousand of those that visit us, and are undoubtedly birds which have been wounded and so temporarily incapacitated from long flights. In this category I place the birds shot during May at Haripal and also others which were found breeding in the Sonthal Parganas.

All snipe are more or less nocturnal, or, at all events, crepuscular in their habits, and their migrations take place almost entirely by night. As a rule, moonlight nights are selected for their journeys, and at the commencement and end of the migration seasons the constant péñch, péñch, of snipe flying overhead may often be heard, although the birds themselves may be far too high to be visible, even on the most brilliant of moonlight nights.

As sportsmen well know, the snipe is very intolerant of sun, and

in the hotter months, during the heat of the day, most birds seek the shelter of some heavy crop, whilst those which stay in the fields of short rice or in similar places get under the shade of the banks which divide the fields or under some specially rank tuft high enough to afford them protection.

I well remember on one occasion shooting near Calcutta on a very hot day in early September when I was still unversed in the ways of snipe, and accordingly failed to work the proper places when the sun got high up. The walking was delightful, thin paddy and ankle-deep mud and water, and from 7 a.m. up to about 9.30 the firing was continuous with a quickly mounting bag. Then suddenly the birds ceased to rise, and weary tramping from 10 to tiffin time, and again on to nearly 4 p.m., was rewarded with scarce half-a-dozen shots, and these at birds which rose at our feet, generally doubling back at once and affording but difficult shots. After 4 p.m., however, the birds seemed gradually to increase again, and the last hour's shooting added some twenty couple to our sticks.

Shooting over the same ground by myself a few days later, as soon as it began to get hot, I hunted about for the birds, and eventually found that after 10 a.m. they all retired to jute and other high crops, generally resting near the edges of the field, but often being flushed from the very centre. Once inside crops of this sort, the birds lie very close, and one can almost stamp on them before they move, and even when forced to fly, they do so in a very lethargic manner and soon re-settle. On one occasion, in the middle of a hot day in September, an orderly of my father's actually caught a snipe in his hand, stooping down and picking it up as we passed along in line. The bird seemed to be uninjured, and flew away well and strongly as soon as released. On another occasion I caught a snipe I had seen settle by throwing my *sola topee* over it, but was punished for my smartness by an erratic-firing friend who promptly blew to pieces the *topee* together with its fluttering captive.

Snipe seem to differ curiously in different provinces as to the haunts they prefer. Throughout Bengal one is accustomed to walk them up in the rice fields, and though, of course, they haunt shallow swamps and jheels as well, it is, undoubtedly, in the rice fields that five out of every six snipes are annually shot. In the Sunderbands

we found that our biggest bags were obtained in the middle of the day in the big jheels of deep water, where we had to wade in any depth from our knees to our chests. The snipe got up close to us and appeared in most cases to have been resting *under* the big lily-leaves which covered the whole surface of the water.

In Assam it is little use working the rice fields, though on rare occasions decent bags may be obtained in them. Generally the birds are found in weed-covered lagoons and jungle-fringed tanks where walking is hard and the shooting difficult. In many places in Assam there are wide stretches of water covered with dense masses of floating weed, strong enough to support one for a brief second, yet hardly thick enough to allow one to stand and shoot. In such places I have seen birds so numerous that to get bags of 200 couple all that was required was straight powder, which, needless to say, was never to be found when shooting in ground of this description.

Of Burmah, Tickell says :—

“ Snipe shooting in Burmah or Arakan is a pursuit of pleasure under considerable difficulties. The sport is in its prime long before the country has emerged from the flood of the rainy monsoon, so that *Auceps* has to wade through paddy fields up to his middle (if not haply higher) and under a sun which blisters his back, before he can make a good bag.”

In Upper India Hume records that snipe are to be found

“ in every swamp or marsh, on the margins of ponds, lakes and rivers wherever there is a more or less muddy foreshore protected by low grass, rush or weed. Of all things they seem to love a kind of rush with a circular stem (*Scirpus carinatus*, I think) which is common about the edges of ponds and jheels in the North-west Provinces and which is a sure find for them. In the heat of the day, where *Urher* and similar crops run down to the water edge alongside some jheel, you will often find many snipe in those.”

In Southern India they also seem to frequent ponds, jheels and river edges far more than in Bengal, but in many places they also are often shot in large numbers in the rice fields.

Reid notices a fact about snipe, which is absolutely correct, though not often noticed by sportsmen, and this is that snipe seldom allow their breast and lower plumage to become really wet or draggled.

There are three questions in regard to snipe shooting which seem to be evergreen in their interest to sportsmen, and these three are:—

(1) Is snipe shooting harder in England than in India ?

(2) What constitutes a good shot ? and

(3) What constitutes a good bag ?

As regards the first question, there is, I think, little doubt that on the whole, snipe are harder to hit at home than in India. There *can* be no doubt that the average snipe at home is wilder, flies faster and twists more than he does out here, but, on the other hand, the difference between shooting on a sweltering day in September in the Plains of India and shooting at home on a frosty day is very great indeed, and goes a long way to level up the chances between the gun and the bird. As the weather gets colder, the birds out here get away quicker and stronger and more nearly approach in their flight their English brethren.

As to what constitutes a good shot is difficult to say. One cannot find out if a man is a good shot by the result of one day's shooting. Sometimes birds seem specially sluggish, the walking is good and the shooter fit, so that missing seems harder than hitting ; other days birds are unaccountably wild, the walking is deep and treacherous, and the powder consequently wasted. Possibly calculating on a whole cold weather shooting the man who gets one bird to every two cartridges expended may *call himself* a good shot, he who finishes up the season with an average of two in three *is* a good shot, whilst the man with an average of three in four is hard to beat, and may be considered a really crack shot.

The best shooting I have ever *seen* was done by my father, Mr. E. B. Baker, in 1884 at Hugli. He commenced with twelve consecutive kills, then a miss, and twelve more kills, then another miss and fourteen kills, after a third miss yet another dozen birds.

This meant fifty-one birds in fifty-four shots, and his final bag for the day was eighty-four birds in ninety-two shots.

The best shooting I have ever *heard* of, which was properly authenticated, was the performance of Mr. H. Cornish, then Superintendent of Police, Orissa. The shooting was the result of a bet of 25 to 1 that he could not shoot a hundred birds with a hundred cartridges, 10 to 1 that he would not get ninety-six, and 3 to 1 that

he would not get ninety. Mr. Cornish got up to his fiftieth bird without a miss, and eventually failed by exactly four birds to get his hundred birds in a hundred shots. On this occasion the walking, as might have been expected, was as near perfection as possible, and the birds so numerous that it was never necessary to take difficult shots. Even under these circumstances the shooting was wonderful, and it will be long before it is beaten.

As to what constitutes a good bag, this depends entirely on the locality. In Upper India bags of 100 couple to two or three guns are always possible, but to a single gun bags of anything over fifty would be considered good. In Southern India such bags would be quite exceptional, and in Ceylon even more rare. In Assam a bag of thirty couple is good, though in Sylhet, and sometimes in Cachar and Goalpara, much bigger bags are obtained. In Bengal, however, it is every snipe-shot's ambition to get 100 couple to his own gun, and though few ever realize this ambition, many get very close to it and some do even better. The same thing occurs in Burmah, and 100 couple to one gun has two or three times been beaten in that province.

The honour of making the biggest bag on record belongs to Mr. W. K. Dods, who, on the 18th February, 1900, shot 131 couple of snipe and a quail. *In epistolâ* Mr. W. K. Dods writes to me:—

“On the 17th February, 1900, information reached me that there were a considerable number of snipe on a particular jheel of immense extent about 100 miles from Calcutta, where I had already made some good bags. I accordingly started off that night, well provided with cartridges, in a slow, jolting train that eventually deposited me at dawn within an hour's tramp of my destination.

“Some miles' walk took me through cultivated country until the landscape, getting gradually more open, brought me to a large swamp tract of country covered with about the worst kind of ‘ponk’ it has ever been my fate to shoot in—a black reeking mud composed entirely of decayed and decaying vegetable matter, in which one frequently sank to one's thighs. Growing in this ooze were dense clumps of *hoogola* reeds interspersed with fairly open glades, where birds could feed, and with other patches of thin null jungle in which snipe delight to rest during the day, secure from the too pressing attentions of the numerous hawks that infest these marshes.

“Though good for snipe, thin null does not make things any easier for the shooter, already heavily handicapped by the soft and insecure

foothold. A snipe dodging through straggling patches of reeds until he gets high enough to feel the wind, only to again start twisting, makes this, in my opinion, the most difficult form of snipe shooting I know of. However, the birds make up in numbers for the numerous and disheartening misses one makes on a ground of this sort, and, having been told by my men to expect a bag of 100 couple, I came well supplied with ammunition.

"Unfortunately snipe on this particular jheel do not sit well till after 12 o'clock, so I began operations about 8 a.m. on another stretch of equally soft and stagnant 'ponk,' in which I pounded about till 10.30, getting fourteen couple and tiring myself a good deal with the heavy going. By 11.30 I was compelled to take another breather, by which time the bag had increased to twenty-four couple, and as I was now thoroughly disgusted with three and a half hours' floundering about in the abominable mud, I insisted on being taken on to the good ground. Good, indeed, it was, not swarms of birds rising in wisps of twenty and thirty as one sometimes sees, but evenly distributed in ones and twos all over the place. There were also a considerable number of jack and painted snipe about, but these I tried to avoid shooting, though in the end I got two jacks. These were the result of snapshots taken at birds disappearing over the tall reeds when there was no time to discover one's mistake till after the trigger had been pulled.

"Many dead birds fell amongst the tall hoogola, where retrieving them was most troublesome and tiring work for the coolies, and though I had three of my best men out that day, I would not like to say how many birds were lost.

"In spite of these drawbacks, the excellence of the sport and the difficulty of the shooting kept my keenness up till 5 p.m., when I found the men were so used up as to be practically useless, and as I was beginning to go a bit off my shooting myself, I decided to give up. On counting over the birds on the sticks I found 259 common or fantail snipe, one pintail snipe, two jack and a quail. What the latter was doing in such an uninviting spot it is hard to say, unless it had been driven into the tall hoogola by hawks. I only once got two birds at a shot that day, and was using an ordinary hammerless gun, Schultze powder, No. 8 shot, and last, but not least, a hand protector.

"Though I have on six other occasions shot bags of over 100 couple on that particular ground, this was the last and best. Since then a dense growth of green rushes has spread itself all over the jheel, and so covered up the feeding that birds are comparatively scarce, though from thirty to forty couple might still be got in a day. Taking into consideration, however, the long railway journey, the hard work and heavy going, I have never considered the place worth visiting of recent years."

The biggest bag, to which I can find any reference, made in Southern India or Ceylon, was obtained by Mr. George Rice on the 16th February, 1893, when this gentleman succeeded in bringing to bag no less than $103\frac{1}{2}$ couple of snipe to his own gun, his previous best day having been $63\frac{1}{2}$ couple shot on March the 14th the previous year. In all probability nearly all these were Pintail.

Such bags as these have never fallen to my lot, but I once had the luck to come across the birds in such numbers that though I was not on the ground until 3:30, I had to stop before 5, having run out of cartridges. On this occasion the bag consisted of twenty-six couple of snipe and $3\frac{1}{2}$ couple of quail, and the cartridges expended numbered seventy-nine. The ground was mud and water of only a few inches in depth and the walking was ideal, but the paddy was very long, and we lost a few birds in it.

I have often been asked whether it is better to shoot at snipe directly they rise or to wait until the twistings cease and the bird gets straight on the wing. Probably the best way to shoot is that which suits each individual best. I have seen equally good shots amongst both types of performers, and do not think the preference can be given to either style. Mr. Cornish knocked his birds over so quickly that to the looker-on it appeared as if he must have spotted them before they rose. My father, on the contrary, was a slow shot and let them get well away before firing, yet as regards their second barrels, there was nothing to choose between them. Mr. Dods, who is probably the finest snipe shot in Eastern India at present, I believe lets his birds get well on the wing before shooting.

The ordinary call of the snipe is, as everyone knows, a single note which has been described in many ways, but may be syllabized as péuch, pronounced sharply with a nasal twang. In the breeding season, however, the snipe makes a sound, called either drumming or bleating, which was for a long time a subject of keen discussion.

Dr. P. H. Bahr (in *loc. cit.*) has written a long and most interesting article on the manner in which this sound is produced, and has conclusively proved that it is made by the tail feathers.

The following is an extract which he has kindly given me permission to take:—

"In the summer of 1904, in the Fens of Cambridgeshire, I began to observe the Snipes in the act of bleating through a strong prism binocular. I had read none of the literature on the subject, and so had no preconceived ideas. The observations I made then I have had ample opportunities of confirming.

"I find that ordinarily the bird flies up to a height of 60—100 feet above ground, in windy weather going higher, with its tail held in the ordinary position of flight, then turning, it spreads its tail like a fan, *the two outer tail feathers* being spread out well in front of the other twelve and held firmly there. Immediately the birds begin to descend the bleat is heard (making due allowances for the time it takes for sound to travel). While descending the bird makes tremulous motions with its wings from the radiocarpal joint. The descent is made from 30—40 feet and occupies two to three seconds, the bleat lasting the same time. The bird does not drop head foremost through space, but at an angle of from 45° — 60° with the horizon. The tail as a whole is not vibrated, but it is quite easy to see the two outer tail feathers with a strong glass vibrating to such an extent that their terminal portions become indistinguishable. Snipes begin to bleat in March, but if the weather is mild, in February, and continue to the end of May, though I heard one last year in Sutherland still bleating on June 25th.

"At the beginning of the breeding season they may be seen bleating in pairs; but later on, when the hen is sitting, the cock bird may be seen performing alone over the marsh where the nest is placed. Under favourable conditions many bleat together, circling round the same spot for hours. On April 12th of last year I had the good fortune to hear no less than twelve birds bleating together, a concert which they kept up all through the night. Every now and again, as if by common consent, there would be a lull and all the birds would settle, but directly one began again all the rest immediately joined in the chorus.

"Snipe bleat best in the early morning and in the evening, especially when the weather is dull and damp. It may be of interest to note that last spring I saw a specimen of the melanistic variety (Sabine's Snipe) bleating.

"Once having convinced myself that the two outer tail feathers are invariably spread out beyond the others—a fact which is now obvious to me with the unaided eye—it seemed to me that the two outer tail feathers must be the active agents in causing the bleat. I accordingly procured several tails of the Common Snipe, and, taking the two outer tail feathers, pierced the shaft with a pin to which I firmly bound it with cotton and inserted the feathers into a cork at the end of a stick some six inches long. A hole is bored at the other end of the stick and a long string attached. This is whirled round the

observer's head and a typical bleat is produced. The second outer tail feathers (sixth pair) produce a fainter sound; though this varies much in individual tails, the others make no sound at all.

"In order to ensure the success of the experiment, it is necessary: (1) that the feathers be placed so that the narrow edge—the outer web—shall encounter the resistance of the air; (2) that the feather be firmly bound to the pin, so that it cannot turn on its support; (3) that the string be tied to one end of the stick, so that the long axis of the stick makes an angle with the direction of the string, if I may so put it, so that a vibratory motion is imparted to the stick as a whole, thus simulating the tremulous motion of the snipe's wings during the descent; (4) lastly, that the apparatus be moved at a uniform rate, and not too fast.

"It is then found that after a period of silence the feathers begin to vibrate; first, the long drawn-out note, which I may represent as '*Whu, Whu, UU,*' becomes gradually audible; it is then succeeded by a series of high and low notes, '*Bah, Bah, Ah, Ah,*' resembling the bleat of a young goat, lasting three to five seconds, followed by a *pause of equal length*. This is repeated as long as the apparatus is revolving at a uniform rate. It is found that the individual tail feathers, of which I collected a good number during the winter, vary considerably both in size, breadth, and markings, and, as might be expected, the note produced varies according to their physical characteristics. Thus a long narrow feather produces a sound of far higher pitch than a broader one of the same length. This fact I have noted when comparing the sound made by the several birds when performing the nuptial evolutions over the breeding ground. To ascertain which part of the feathers is essential in the production of the sound, I have cut off the narrow outer web without altering the bleat in any way; but if the barbs of the inner web be so disarranged that there is a break in their continuity, the web ceases to vibrate, and no sound is produced. That the vibration of the inner web is the active causative agent may be seen by the following simple experiments. The feathers are attached to a cork with the outer web held away from the observer, so that the narrow outer web shall meet the resistance of the air. Thus affixed, they are held out of the window of a train or while riding a bicycle. As the resistance of the air is encountered, the inner web begins to vibrate, slowly at first, but, as the train gains speed, so rapidly that its outline is entirely lost and it becomes blurred; a low humming sound is at first heard, which soon reaches the typical pitch of the bleat. When the train has reached the speed of some twenty miles an hour, the whole feather will vibrate on the pin. If the feathers are at all loose on their pins, it is curious to observe how they will always turn round, so that the narrow outer edge encounters the resistance of the air.

Furthermore, if the feathers be damped, they appear to act better, thus explaining, perhaps, why snipe are found to be liable to bleat in damp weather. I think this simple experiment readily explains away the 'adverse cases' of Prof. Altum ('Ornithologisches Centralblatt,' October, 1880), already mentioned.

"That the hens bleat as well as the cocks is now, I suppose, a well-known fact (cf. Von Preen, 'Naumannia,' 1856, pp. 426-27, and Meves, Proc. Zool. Soc., 1859, p. 200). I have observed it on several occasions myself. In the summer of 1902, I found four newly-hatched snipe in a patch inhabited by only a single pair; while lying concealed in the neighbourhood, I observed repeatedly *both* old birds drumming over me. From the similarity of structure of the tail-feathers in both sexes—a fact which I have ascertained by dissection—one would infer that both sexes drummed. I cannot, however, agree with Meves that 'as the feathers of the hen are generally less than those of the cock bird, the noise also made by them is not so deep as in the other case' (*Op. cit.*, p. 200). I can find no difference either in the length of the feathers or in the intensity of the sound produced by the feathers of either sex. I have received a letter from Mr. S. A. Buturlin, in which he says that in 1905 on the Kolyma Delta he frequently observed both sexes of the Eastern representative of our species (*Gallinago raddei*) drumming.

"Since the two outer feathers are extended beyond the other twelve during the descent, as I have described, I sought to find by dissection a mechanism by which this might be produced. On examining the tail of a freshly-killed bird, it is quite easy, by spreading out the tail, to make it assume the arrangement shown. I was unable, however, to find any special muscle peculiar to the species controlling its outer two tail-feathers. The muscle pubo-coccygeus ext. is inserted into the base of the shaft of the outer two tail-feathers, and is quite capable of performing this function. This muscle is to be found equally well-developed in the other species of plovers and waders which I examined. The nomenclature of the muscular system of the tail is that of Gadow in Bronn's 'Thier-Reich.'

"I have tried the same experiments as I have just described with the primaries from the wing of the snipe, and was not able to produce any more sound with them than with others taken from other kinds of waders, pigeons, &c. There seems to have existed an opinion at one time that the bird produces two sounds, one with the wings and the other with the tail, the former being known as humming or drumming, and the latter whirring or bleating, produced while the bird is on the ground (cf. 'Zoologist,' 1881, p. 212, and 1846, p. 1501). I cannot say that this agrees with my own experiences."

To the above, Dr. Bahr adds in a letter to me :—

“ An old friend of mine, a very keen naturalist and observer, Master Leherer Praht, of Lilienthal, Germany, has been a disbeliever in the tail theory from observations extending over forty years. He has now had the following experience which has converted him to my way of thinking.

“ He had winged a snipe which ran before him, and in so doing spread its tail with the thin outer feathers stiffened in front of the others, and, as a strong wind was blowing, the feathers began to vibrate and the bird actually ‘bleated’ whilst lying on the ground.

On the strength of the above article by Dr. Bahr, Mr. W. S. Paget-Tomlinson made some interesting experiments which fully confirmed what Dr. Bahr had already written. These experiments Mr. Paget-Tomlinson described in the *Times* of the 21st August, 1909, and 26th December, 1908, as follows :—

“ However, the proof is best furnished by a simple experiment devised by Dr. Bahr. Pierce the shaft of each outer tail-feather with a pin, to which it must be firmly bound. Insert the pins with their attached feathers on each side of a small cork, taking care that the outer web (narrow edge) of each feather faces the same way. Fasten the cork to the end of a short stick (6 inches long). Through a hole in the other end of the stick pass a long string. When the apparatus is whirled round the observer's head, care being taken that the outer web of the feathers meets the resistance of the air (as occurs with the outer tail-feathers of the snipe when it makes its descent) a long drawn-out note is first produced, which gradually rises in pitch until the typical bleating sound is heard. The same effect can be obtained by holding the cork and its feathers outside a railway carriage window when the train gets up speed, but only when the outer or narrow web of the feathers cleaves the air. This outer web may be actually removed from the feather without altering the bleating sound, but if the broad inner web be seriously damaged no sound is produced. The second outer tail-feathers produce a fainter sound, the remaining ones none at all.

“ Mr. Lee Warner, of Walsingham Abbey, suggested to me that it would be interesting to try the experiment of shooting an arrow with the tail feathers of the bird attached, so as to imitate nature as far as possible. I have recently tried this, with the most perfect success. Employing an ordinary ladies' arrow as used in archery, I slipped a small perforated cork down the shaft, as far as the feathers of the arrow. Having tied the cork securely, I fixed the pins, each carrying an outer tail feather, one on each side of the cork, at right angles to the shaft of the arrow, taking care that the outer or narrow

web of the feathers faced towards so as to cut the air when the arrow was shot. It was, of course, also necessary to place the feathers in the same plane as the string, so that they would not be damaged as the arrow left the bow.

"I shot it almost vertically to a height of about 60 or 70 yards. The velocity of the arrow in leaving the bow was probably too great to produce the normal 'drumming' sound, though it somewhat resembled it; when the arrow turned to descend, nothing could at first be heard, but when it gained speed, and was about 30 yards from the ground, the most perfect imitation of the 'drumming' was produced, continuing till the arrow pierced the sod."

Before leaving the topic of drumming or bleating, part of a very interesting article by Mr. Boyes may be quoted from the 'Field' of July 1898. He writes:—

"I am not aware whether any naturalist has stated that the hen bird drums as well as the male, but I think I can settle this point in the affirmative, for one day I visited a very small strip of bog, and almost immediately rose the cock bird which commenced to drum alone and around me in a very short time. I flushed the hen off her nest of three eggs, and as she left it she dropped the fourth egg, which broke in its fall, and the bird, continuing its flight, struck itself against some posts and rails and fell stunned to the ground, but soon recovered and flew away. I marked it, and afterwards went and put it up. All this time the male was drumming overhead, and no other Snipes were in the neighbourhood. The female now joined in the drumming, and the two were drumming for some time, and then they both alighted on the tops of posts, and allowed me to walk quite near them, nodding their heads at me all the while."

The reader will note the curious fact of the snipe sitting on the posts, but, though here in India the idea of the snipe perching seems curiously improbable, it is a well-known fact that in their breeding range and when breeding, they frequently do so.

The food of the Fantail Snipe consists of worms of all or any kind, insects, more especially water insects, tiny shell-fish, land shells, larvæ of dragon-flies, caddis-flies, etc. Digestion in snipes seems to be exceedingly rapid, and often, even in very fat birds, the stomach will be found to contain only liquid, a fact which very probably gave rise to the belief, at one time so common, that snipe lived on microscopic insects and some nutriment they derived from suction of the mud itself.

All snipes possess more or less sensitive beaks furnished with nerves and also with muscles, which enable them to open the terminal halves of their bills when inserted in mud. Both nerves and muscles are more highly developed in the Fantail than in any other snipe (? *G. media*) and accordingly, as we should expect, this species seeks its food more exclusively in mud and water than does any other.

On an examination of snipe shot very early in the morning or late in the evening, that is to say, when feeding, I have often found their stomachs full of a tiny white worm which seems to be found in and about the roots of rice. I have shot snipe with these worms actually in their bills or gullets as well as in their stomachs, but never when the birds were shot late in the day before the sun had sunk low. To obtain these worms the bird has to bore deep into the mud, and must often have to put its whole head under water before it can reach them, as I have shot snipe, containing this article of diet, feeding in water some inches deep.

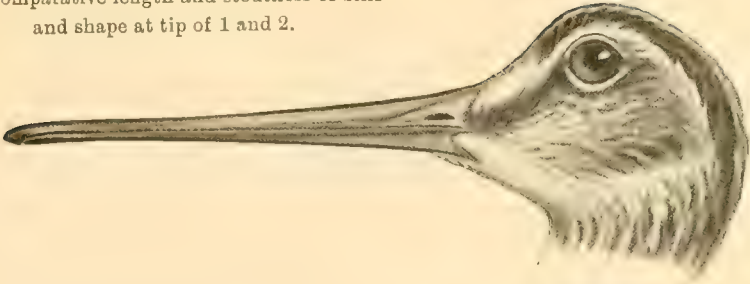
The snipe is not a bird one would have expected to thrive in captivity, but it has more than once been tamed. A most interesting account of a tame Fantail Snipe reared by hand appeared in 'Nature,' and again in the 'Avicultural Magazine.' This bird was so tame that it took worms from the hand of its owner and was sufficiently confiding to allow excellent photographs to be taken of it.

The three Plates are excellent, but it is difficult on a half-tone plate to show the differences between pure white and pale rufescent, and it is probably this reason which accounts for both wings and tails appearing to have more white on them than is generally the case in all the species depicted.

In Plate A the difference between the terminal portions of the bills of *Gallinago stenura* and *G. gallinago* is not quite pronounced enough, and the heads of both birds appear to be a trifle too large. The difference also in tone and depth of colouring between the heads of *G. solitaria* and *G. nemoricola* does not strike one so forcibly in the plate as it does in real life, partly doubtless due to the fact that *solitaria* is more grey and less rufescent than *nemoricola*, a point which we can hardly expect to see emphasised in a black and white plate.

Note comparative length and stoutness of bills
and shape at tip of 1 and 2.

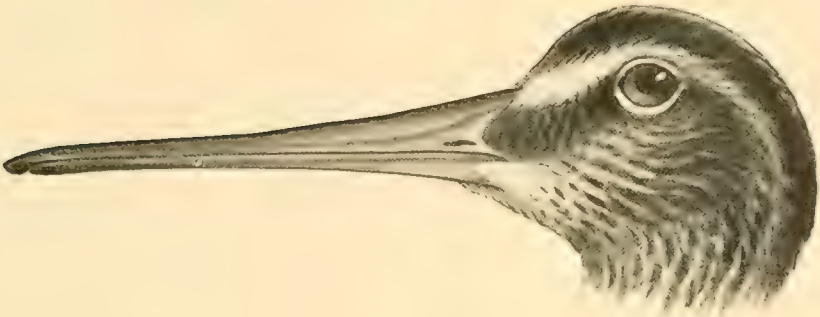
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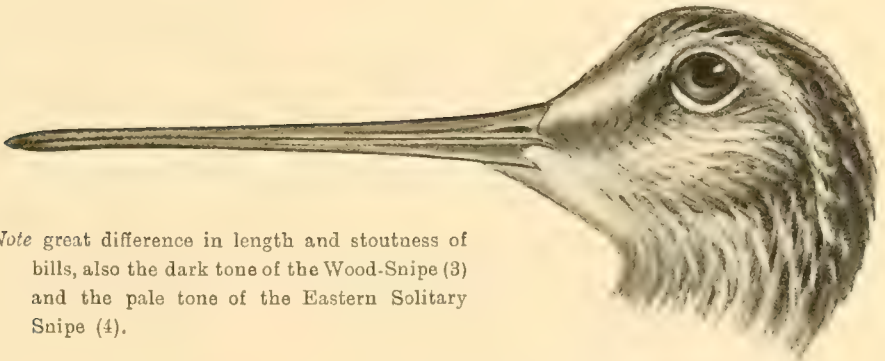
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4



Note great difference in length and stoutness of
bills, also the dark tone of the Wood-Snipe (3)
and the pale tone of the Eastern Solitary
Snipe (4).

HEADS OF SNIPE FOR COMPARISON OF BILLS.

1. PINTAIL SNIPE (*Gallinago stenura*).
2. COMMON OR FANTAIL SNIPE (*Gallinago gallinago*).
3. WOOD SNIPE (*Gallinago nemoricola*).
4. EASTERN SOLITARY SNIPE (*Gallinago solitaria*).

Turning to Plate B, the same remarks as to tone and depth of colouration apply to the wings of *solitaria* and *nemoricola* as to the heads in Plate A.

It is necessary also to point out that the wing of *G. gallinago* is that of a rather darkly, heavily-barred bird. The median wing-coverts are *generally* pure white in this species, and do not show the heavy markings at the bases which we see in these drawings. The axillaries also (these are the four long feathers at the base of the drawings) vary, as I have explained above, from pure white in typical *G. c. raddei* to others which are even more heavily barred than those in the plate.

As regards Plate C, all I need remark is that we must remember when examining it that some of the colouration which appears in this to be white is really a faint rufous. Even allowing for this, however, both the Fantail and Pintail more often than not have tails a good deal less marked with white than those shown here as examples of those birds.

GALLINAGO GALLINAGO RADDEI, Buturlin.

RADDE'S SNIPE.

Scolopax gallinago raddei, Buturlin, *Waders of the Russian Empire*, Part I, p. 56 (1902).

Description.—“Differs from the Western form of the Common Snipe in having the pale longitudinal stripes over the upper parts of the body conspicuously broader, 2 to 4 mm. wide, the median pale stripe on the crown wider, the dark parts of the feathers of the mantle more freckled with rufous, the chest less spotted with brown, the wing lining and axillaries less conspicuously barred with greyish-brown, the axillaries being often quite white.”

The above description was obtained for me by Mr. H. E. Dresser, and is translated from the original Russian of Buturlin.

The breeding range of this snipe is given by Buturlin as follows:—

“Breeds in Eastern Siberia, east to Kamtchatka, and even the Commander Isles, and west to the Boganida, Taimyr and Krasnoyarsk.”

Theoretically, therefore, this snipe should migrate in winter to the whole of Southern China, and should visit Burmah and Eastern India in considerable numbers. As a matter of fact, however, typical specimens are not common, even in the east of India, though on the other hand, it may be found occasionally as far west as Bombay. Of the series of Fantail Snipe in the Asiatic Museum, there are but three specimens which can, without doubt, be allotted to this sub-species, and of these three one—strange to say—comes from Abyssinia! In Eastern Bengal, Assam and Burmah we shall find a very large proportion of birds more or less approach this race in the colouration of their axillaries and under wing-coverts, and to a less extent also in that of their upper plumage, but really typical specimens will be few and far between.

My own experience, gained from a close examination of my own bags and those of other sportsmen whenever possible, has been pro-

ductive of some half-dozen specimens one could really call typical. In some of these the axillaries were entirely pure white and the barring of the lower wing-coverts absent except on the terminal thirds of the greater coverts and the shoulder of the wing.

Nidification.—I have a clutch of four eggs of this snipe in my collection, given me by Mr. H. E. Dresser, who secured them from Dr. Buturlin. As might be expected, they are not distinguishable from those of the Common Snipe, though they are duller-coloured than most eggs of that bird.

The ground colour is dull olive, stone-colour, in one egg rather more brown than in the other three, and the markings consist of large and small blotches and spots of different shades of vandyke brown, all dark and many almost black. Underlying there are others of purple grey and washed-out brown. At the larger end, where the blotches are very numerous, they run into and overlap one another; elsewhere they are smaller and sparsely scattered. In one egg there is a long twisted line of dark brown, about $1\frac{1}{2}$ inches in length and very narrow; this forms a circle at the extremity of the larger end.

They are of the usual pyriform shape, and do not differ in texture from the eggs of *Gallinago gallinago*.

They measure 1.56×1.11 inches, 1.56×1.13 , 1.58×1.15 , and 1.56×1.09 . They were taken at Pokkodski, Kolyma, on the 22nd June, 1905.

GALLINAGO MEDIA.

THE GREAT SNIPE.

Scolopax media, *Lath. Gen. Syn. Suppl.* i, p. 292 (1787).

Scolopax major, *Gmelin, Syst. Nat.* i, p. 661 (1789); *Seebohm, Charadriidæ*, p. 482.

Gallinago major, *Sharpe, Cat. B. M.* xxiv, p. 626; *id. Hand-L.* iii, p. 201; *Oates, Cat. Eggs, B. M.* ii, p. 60; *Oates, Game-B.* ii, p. 467; *C. Donovan, J. B. N. H. S.* xii, p. 782; *Finn, In. Waders*, p. 152; *Stuart Baker, J. B. N. H. S.* xx, p. 573 (1911); *id. Ibid.* p. 1155.

Description. Adult Male.—"General colour above black, mottled with sandy buff, with which the feathers are fringed and barred in an irregular and wavy manner, so as to leave large patches of black; the scapulars with whiter and broader edges, so as to form a double line down the back; lower back, rump and upper tail-coverts sandy buff barred with dusky brown, the end of the tail-coverts white; wing-coverts blackish brown, the marginal series with ashy fringes, the remainder with conspicuous white tips, before which is a black subterminal bar, the inner greater coverts also barred with sandy rufous; bastard wing and primary coverts blackish, tipped with white; quills dark brown, the secondaries tipped with white, the innermost being barred with sandy rufous and resembling the back; tail feathers bright rufous, with black bases and black bars on the terminal half of the feathers, scarcely visible near the tips; the white tip to the feathers gradually increasing in extent until the four outer ones on each side are entirely white except for a little black near the base; centre of crown whitish, bordered on each side by a broad band of black, slightly freckled with rufous, and followed by a broad superciliary streak, ashy whitish in front and fulvescent behind; a dusky streak from the base of the bill to the eye; sides of face whitish, with numerous tiny blackish spots, and a dark patch below the ear-coverts; the hindneck and sides of neck sandy buff, streaked with black, chin, breast and abdomen white; the lower throat, foreneck and breast pale sandy buff, with central spots of black on the feathers; the sides of the breast and flanks regularly barred

with black; the under tail-coverts sandy buff, tinged with rufous, and having more or less complete bars of black; under wing-coverts and axillaries, white, barred with black, the latter very distinctly banded; lower primary coverts and quills below, uniform ashy brown." (*Sharpe*).

Colours of Soft Parts.—"Bill brown; feet light slate colour; iris very dark." (*Ayres*.)

"Bill dull flesh coloured at the base, darkening to black at the end; legs dull flesh colour, the joints plumbeous, iris dark brown.

Measurements.—Culmen 2·4 inches, wing 5·5, tail 2·5, tarsus 1·4." (*Dresser*.)

"Culmen 2·45 inches, wings 5·55, tail 2, tarsus 1·35." (*Sharpe*.)

Adult Female.—Similar to the male.

Measurements.—"Culmen 2·5 inches, wing 5·35, tail 2, tarsus 1·5." (*Sharpe*.)

From the above it will be seen that the female, as far as is shown by the few sexed females in the British Museum Collection, is a somewhat smaller bird with longer bill and legs. The wings in a few females sent to me for examination have averaged 5·50 inches.

Winter Plumage.—"More sandy buff than in summer, the buff edges to the feathers of the upper surface broader and more conspicuous, the blackish markings on the foreneck larger and coarser, and either circular or horse-shoe-shaped." (*Sharpe*.)

Young.—The young have less white about them than the adult, the white outer tail feathers being a good deal barred; in addition to this the general tone is much more rufescent and the lower surface darker.

Nestling.—Ashy-fulvous, the crown and centre of the back more rufous; sides of the face and a broad supercilium white; coronal and orbital lines black, and other lines of black about the face; wings rufescent fulvous, sides of back and a patch on each flank black. Under surface bright fulvescent, a dark patch on the lower throat, and the centre of the abdomen nearly white.

Distribution.—Breeds in Northern Europe and in Western Siberia, as far north as 69° N. Lat., as far east as the Valley of the Yenesei, and winters in Southern Europe and Northern Africa; also extending throughout Western Asia, through Asia Minor to Persia.

The first record of its occurrence in India is that in the B.N.H. Society's Journal, vol. xii, p. 782, by Capt. Donovan.

This gentleman recorded that on the 5th September, 1899, he shot a bird near Madras weighing over 8 ozs., and with a wing of about 6 inches in length, which he sent to the Madras Museum for identification. The Museum authorities pronounced the bird to be *Gallinago nemoricola*, and then, as it was far advanced in putrefaction, threw it away.

Fortunately, before sending the bird away, Capt. Donovan carefully examined it and made copious notes. The main features noticed by him in his examination of the bird were:—

- (1) Its outer tail feathers were soft,
- (2) Not attenuated,
- (3) Were white with only two or three bars near their bases on the outer webs, and
- (4) In addition to this the snipe had conspicuous white tips to the wing-coverts.

These points are ample for the purposes of identification, and there cannot be the least doubt but that the bird shot by Capt. Donovan was a specimen of the *Double* or *Great Snipe* (*Gallinago media*).

A second specimen was obtained by Capt. Boxwell at Bangalore on the 28th October, 1910. This bird weighed only 7 ozs., and was shot from a patch of mud beside a stream.

A third bird was killed by Mr. G. L. Peters near Arkonam (Madras) on the 30th March, 1913.

So far these three are the only records of the Great Snipe's occurrence in India; but there is no reason why it should not be found more frequently, and it is curious that it should be first recorded from the extreme S.E. It has been obtained at Fao in Southern Persia by Cumming, and in its western range it migrates very much further south than the latitude of this place; indeed it has been obtained as far south in Africa as Cape Colony itself. Here in India we should expect to meet with it occasionally in any part of Baluchistan, Sind or Northern Bombay, and less often in other parts of Western and Southern India.

Nidification.—Its breeding season varies according to the latitude.

In the most southern portion of its breeding range its eggs may be taken as early as the first week in April, and through May into early June, but in the more northern latitudes it will not be found to lay until at least a month later, and few, if any, eggs will be taken before June.

It is very doubtful if the Great Snipe "drums" in the true sense of the word. Dr. Bahr as a result of his experiments with the tail of this snipe, writes "the feathers produce *no* sound," a result which he obtained only from experiments with the tail feathers of the Great Snipe and the Jack Snipe.

It does, however, produce a sound during the breeding season, which has not yet been explained, and may therefore be either vocal or mechanical.

Professor Collett in 'Dresser's Birds of Europe' (vol. vii, p. 635) thus describes its breeding habits:—

"It has a so-called *Lek* or *Spel* like some of the Grouse tribe, a sort of meeting-place where they collect to drum and often to engage in combat for the possession of the females. . . . It does not indulge in aerial evolutions, but remains on the ground. . . . The male bird utters a soft, almost warbling note, which is accompanied by a peculiar snapping sound caused by striking the mandibles together several times in quick succession. If a person approaches one of their humming places he can hear at some distance the low note: 'bip, bip, bipbip, bip-biperere, biperere;' and when within 100 paces, if the night is still, he begins to hear other peculiar sounds. . . . Whilst producing these notes the bird is in ecstasy and raises and spreads his tail like a fan, the outer tail feathers showing in the half darkness like two white patches."

Dr. Bahr conjectures that these sounds are vocal, but he has shown (vide *G. gallinago*) that the drumming of the Common Snipe *can* be produced, under certain circumstances, on the ground, and it therefore seems possible that the Great Snipe also "drums" by some mechanical vibration of his tail feathers.

Seeböhm says that this snipe

"Makes its nest in long grass, but more often in the middle of a hillock of sedge or grasses. A small quantity of moss or dead grass is placed as a lining to the depression where its four eggs are laid."

The eggs of the Great Snipe are very handsome, and vary in

ground colour from pale greyish-buff (sometimes with the faintest possible green tinge) to pale brownish-buff, and are spotted and blotched with rich dark brown and paler brown, and with underlying markings of purplish-brown and grey. Most of the blotches are distributed round the largest part of the egg, often in an oblique direction, and many of them are confluent. Some eggs have the large end covered with a network of streaks, but more often only a few lines are seen. The underlying markings are large, numerous and very conspicuous.

I have an extremely handsome clutch of three eggs of *G. major* in my collection, taken in Denmark on the 14th June, 1874. The ground colour is a bright pinkish stone-colour blotched all over the surface with very large blotches of vandyke brown, some bright and clear, others almost black; the sub-surface marks are of the same description and nearly as large, but of a lavender and purple-grey colour, and rather less numerous.

When newly taken, these eggs must have been extraordinarily glossy, as now, after a lapse of forty-six years, they are still more glossy than most snipes' eggs. These eggs measure between 1·80 (= 45·7 mm.), and 1·84 inches (= 46·7 mm.) in length, and 1·24 (= 32·0 mm.), and 1·28 (= 32·5 mm.) in breadth. They are of the usual snipe and plover peg-top character in shape, but the texture seems harder and closer than in most snipes' eggs.

This curious pink ground colour agrees well with Oates' description of the eggs of *G. solitaria*, a colour, which he says, renders the eggs of that bird easily distinguishable from all other snipes' eggs.

The ordinary full clutch consists, of course, of four eggs, as with all other true snipes.

Seebohm gives the size as varying between 1·7 and 1·9 inches in length, and between 1·22 and 1·3 in breadth, and Dresser gives the average as $1·75 \times 1·24$, and in 'Eggs of the Birds of Europe,' p. 688, gives the variation in length as between 1·73 and 1·83 inches, and in breadth as between 1·21 and 1·28. Jourdain gives the measurements as bigger than this, and the average of thirty-one as being $1·79 \times 1·33$ inches (= $45·4 \times 33·7$ mm.)

General Habits.—The Great Snipe seems to be even more exclusively nocturnal in its habits than the other members of the genus, feeding almost entirely by night and not moving, unless forced to do so, after the sun has risen at all high.

It is found in much the same sort of country and ground as *Gallinago gallinago*, but is perhaps rather inclined to lie up in thicker cover than does the latter bird. In their diet the Common Snipe and the Great Snipe resemble one another very closely, and an examination of the bills of these two birds will show that this is what we should expect, as in structure and sensitiveness they are much the same.

Dresser says that its food consists of worms, small slugs, insects and larvæ.

The flight of the Great Snipe is very inferior to that of the Fantail or Pintail Snipe, and more nearly approaches that of the Wood Snipe, though it does not appear to indulge in the curious side movements and sudden final plunge into cover so characteristic of that bird; still, it is comparatively slow and heavy on the wing and offers an easy shot.

I can find no record of any day's shooting devoted entirely to this snipe, and when shot it seems invariably to form merely a part of the bag on days when the Common Snipe has been the object of pursuit.

GALLINAGO STENURA.

THE PINTAIL SNIPE.

Scolopax stenura, Kuhl, *Seebohm, Charadriidæ*, p. 447; *id. B. Jap. Em.* p. 345.

Scolopax horsfieldii, Gray, *Zool. Misc.*, p. 2; *id. et Hardw. Ind. Zool.* ii, Part 54.

Gallinago horsfieldi, Hume, *S. F.* iii, p. 182.

Gallinago stenura, *Jerd. B. of I.* iii, p. 674; *God.-Aus. J. A. S. B.* xxxix, p. 273; *Blanford, ibid.* xlx, p. 270; *Marshall, S. F.* i, p. 428; *Hume, ibid.* p. 423; *Hume, ibid.* ii, p. 294; *Parker, ibid.* p. 335; *Ball, ibid.* p. 431; *Blyth & Wald. B. of B.* p. 156; *Armstrong, S. F.* iv, p. 340; *Hume, ibid.* v, p. 46; *Butler, ibid.* p. 212; *Legge, B. of Cey.* p. 816; *Oates, Birds of B. B.* ii, p. 383; *Sharpe, Cat. B. M.* xxiv, p. 619; *Blan. Avifauna of B. I.* iv, p. 289; *Finn. In. Waders*, p. 148; *Sharpe. Hand-L.* i, p. 165; *Oates, Game-B.* ii, p. 469; *id. Cat. Eggs B. M.* ii, p. 356; *Stuart Baker, J. B. N. H. S.* xii, p. 500; *Butler, ibid.* xiii, p. 149; *Wall, ibid.* xv, p. 722; *Williamson, Journ. N. H. Siam*, i, p. 48; *Barton, ibid.* p. 109; *Grant, ibid.* p. 117; *Gairdner, ibid.* p. 152; *Robinson & Kloss, Ibis*, 1910, pp. 659-75; *id. ibid.* 1911, pp. 10-80; *Wait, Spolia Zeylanica*, x, p. 237 (1916); *Stoney, J. B. N. H. S.* xxv, p. 306 (1917).

Gallinago sthenura, *Le Mess. S. F.* iii, p. 380; *Hume & Dav. ibid.* vi, p. 459; *Hume, ibid.* vii, p. 39; *Dav. & Wen. ibid.* p. 88; *Ball, ibid.* p. 228; *Cripps, ibid.* p. 301; *Hume, ibid.* vii, p. 69; *id. ibid.* p. 112; *Bingham, ibid.* p. 196; *Scully, ibid.* p. 354; *Butler, Cat. B. of S.* p. 61; *id. Cat. B. S. Bom. Pres.* p. 75; *Vidal, S. F.* ix, p. 83; *Bingham, ibid.* p. 196; *Reid, ibid.* x, p. 68; *David, ibid.* p. 320; *Davis, ibid.* p. 413; *Murray, Vert. Faun. Scind.* p. 239; *Hume, S. F.* xi, p. 319; *Blocch, J. B. N. H.* xxiii, p. 777; *Stoney, ibid.* p. 778.

Pintail Snipe, *W. Gaye, J. B. N. H. S.* vi, p. 418; *St. J. Richardson, ibid.* p. 488.

Vernacular Names.—Few natives appear to recognise the difference between the Pintail and Fantail Snipes, and the vernacular names given to the latter apply equally to both.

Pazembon Kya or Ja (*Kyauksé, Kachin Hills*).

Description. Adult Male.—The Pintail Snipe differs from the Fantail in coloration in having the whole of the axillaries and



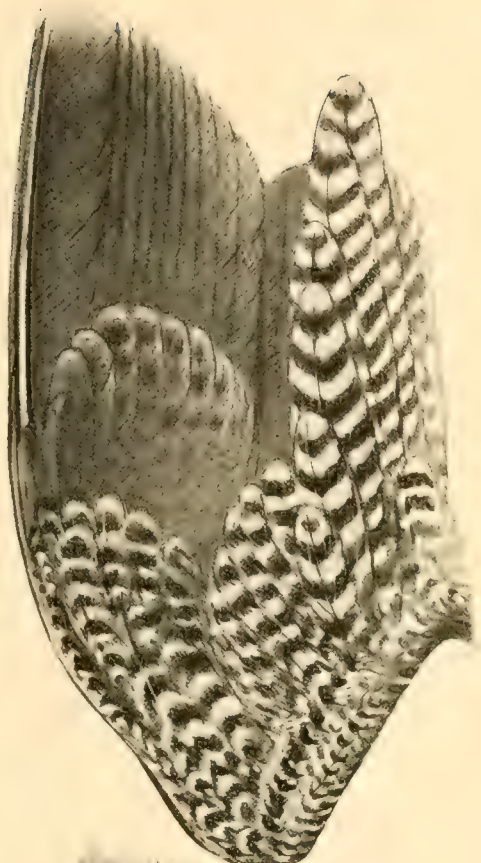
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UNDER WINGS OF SNIPE.

- | | | | | | | | |
|------------------|--|---|--|---------------------------|-----|-----|--|
| 1. PINTAIL SNIPE | | Note regular barring on the Pintail and whiter median coverts on the Pantail. | | 3. WOOD SNIPE | ... | ... | } Note difference in depth of colouration and comparative length of inner primaries. |
| 2. PINTAIL SNIPE | | | | 4. EASTERN SOLITARY SNIPE | ... | ... | |

under wing-coverts regularly barred throughout with black, or brown, and white, the former colour being predominant. The average bird is also duller and darker in its coloration, this more so on the lower than the upper parts. The bill is proportionately shorter and stouter, and the tail consists, normally, of 26 or 28 feathers, the external 8 or 9 on each side being very stiff and narrow, the outermost only about '1 inch in width.

The outer web of the first primary is, in all text-books, said to be brown, but this is not quite correct, as in a large series one finds many specimens with very pale outer webs, though these may never be quite white.

Colours of Soft Parts.—"The legs and feet are greenish or greenish leaden, but, especially late in the spring, these parts exhibit, in some birds, a distinct olive-yellow tinge; the irides are deep brown; the bill generally has the gape, the extreme base and margins of the upper mandible greenish or olive, but sometimes some or all of them are unicolorous with the rest of the basal four-sevenths of the upper mandible, which are usually pale hoary brown; on the other hand, even these at times show a greenish tinge; the terminal three-sevenths of the bill are deep brown, blackish hoary towards the tip, and paling towards the opposite direction." (*Hume.*)

All I can add to these notes is that I have often seen the Pintail with legs and feet of an olive yellow colour even in September and October, and have had specimens sent me in these months whose legs when fresh were described as yellow, and it is probable that old birds have their legs more decidedly yellow than the young.

Measurements.—"Length 9·75 to 10·9 inches, expanse 15·5 to 17·4, wing 4·95 to 5·42, tail from vent 2·0 to 2·57, tarsus 1·19 to 1·27, bill from gape 2·12 to 2·25, bill at front 2·2 to 2·6, weight 3·3 to 4·75 ozs., average 3·91 inches." (*Hume.*)

Stoney gives the average weight of 472 Pintails as 4·014 oz. and of 2,347 birds as 3·93, a net total average of about 3·95 ozs.; and Mr. W. Gaye records shooting a bird of the extraordinary weight of 12½ tolas (about 7 ozs.) This was at Secunderabad on the 6th January, 1890.

Adult Female.—The female only differs from the male in being somewhat larger.

Measurements.—Hume gives the dimensions of the female as

“Length 10·1 to 11·17 inches, expanse 16·1 to 18·25, wing 5·0 to 5·58, tail from vent 2·0 to 2·67, tarsus 1·2 to 1·35, bill from gape 2·38 to 2·62, bill at front 2·45 to 2·7, weight 3·75 to 5·1 ozs., average 4·2 ozs.

The average measurements of those I have measured have been *males*, wing 5·11 inches (=129·7 mm.), bill 2·35 (=59·7 mm.); *females*, wing 5·25 (=133·3 mm.), bill 2·41 (=61·7 mm.) Sharpe gives the measurements as *male*, wing 4·9 (=124·4 mm.), bill 2·3 (=58·4 mm.); *female*, wing 5·1 (=109·5 mm.), bill 2·45 (=62·2 mm.).

The Pintail Snipe is extremely variable in its plumage, and I quote Hume's remarks, anent this variation, in full. He says:—

“I have specimens now before me with the entire lower breast, abdomen and vent pure white and unmarked. I have others with the whole of these parts barred, almost as strongly and as regularly as in *nemoricola*. There are some in which the front of the throat and upper breast are fawn-coloured, blurred with numerous ill-defined spots and streaks of dark brown, and others in which the upper breast is strongly and distinctly, though irregularly *barred*. . . . The upper surfaces differ widely; some are altogether brighter, the black more intense, the markings on the scapulars more intense rusty, their pale margins a brighter and richer buff.”

The variations in the under parts are certainly individual, but on the upper parts the brightness and depth of colouring depend, as in so many birds, on the newness of the feathers. As is well known, black and red are the colours, next to green, which *weather* most and consequently show most variation in the colouration of new and old feathers.

Just as there are pale and melanistic forms of the Fantail Snipe, so are there of the Pintail.

Of the latter type there is, however, but one at present on record, and that is the one recorded by Hume in ‘Game-Birds.’ Of this he writes:—

“Before the Mutiny I had a specimen procured near Dacca, which was everywhere blackish dusky, darker than either of the only two Sabine's Snipe I ever saw, but very similar to these; but alike in these and in all the albinoid specimens I have seen, the wing

lining and axillaries differed but little from the normal type, and had not participated, at any rate to the same extent, in the general change or loss of colour."

The pale, or albinoid specimens, as Hume terms them, are almost equally common in both species. Hume writes:—

"I have a fine example now before me, procured by my friend, Mr. J. C. Parker, near Calcutta. The lower surface does not much differ from the normal type, except that the markings on the breast and flanks are pale brownish grey, but the entire upper surface is a mixture of pale cream-colour and pale brownish-grey. I have seen at least half-a-dozen similar creamy-coloured birds in the course of the last thirty years. I also once shot one that was snow-white everywhere, with only faint traces of grey markings.

The Bombay Natural History Society possesses three pale specimens of *G. stenura*, and there is a fourth in the Indian Museum, Calcutta, all of which are very similar in their colouration to the pale specimens of *G. gallinago* already described. The Bombay birds, curiously enough, both have a few feathers of the scapulars and tail normally or partly normally coloured, a fact I have also noticed regarding some of the pale specimens of the Fantail. The Indian Museum bird has a few normally coloured feathers on the upper back, and appears to be moulting into normal plumage, as these feathers are all new.

Another specimen in the Indian Museum is very beautiful; the ground is pure white, but the markings are of a curious vinous-grey, pale everywhere, with a few deeper markings showing on the scapulars.

In describing *Gallinago stenura*, it has already been said that this snipe normally has twenty-six or twenty-eight tail feathers, of which the lateral eight or nine pairs are attenuated; these outer feathers, however, vary considerably in number, and it is not unusual to find as few as six pairs only of these, the central feathers, ten in number, never varying.

It is a curious coincidence, also, that in the majority of cases in which this small number of feathers is found, the birds seem considerably larger than the average. My attention to this curious combination, *i.e.*, extraordinary size with so few tail feathers, was

first attracted by some letters to the 'Indian Field' written by Mr. W. Val Weston, under the *nom-de-plume* of "Silvertown." On the 29th October he wrote giving the measurements of one of these snipes: "beak $2\frac{3}{8}$, wing $5\frac{1}{8}$, weight $5\frac{1}{2}$ oz."; on the 11th he sent the measurements of two more, "bill at front $2\frac{1}{2}$ and $2\frac{3}{4}$, wing $5\frac{3}{8}$ and $5\frac{1}{2}$," and on the 30th November he recorded a fourth, but did not give measurements of bill and wing.

Mr. Val Weston has kindly added further information in regard to these big Pintails in letters. He first sent me a specimen (now in the B.N.H. Society's Museum) which measured when dry, wing 5.35 inches, bill at gape 2.63, and then on the 2nd January, 1910, wrote me as follows:—

"Yesterday I shot two more of these big snipes, and also an ordinary Pintail and a lot of Fantail. The difference between the big and small forms is most marked, and they are easily distinguished when in the air. The measurements of the two are, wing, each $5\frac{1}{2}$, bill at front, each $2\frac{1}{2}$, weight, both considerably over 5 oz. Tail feathers 22 and 23. The big Pintail does not come in at the same time as the ordinary small birds. By the 1st September the country is full of Pintail Snipe, but amongst them never one of these big birds. By October the Pintails have moved on, and their place is taken by Fantails, and it is then that we begin to look for the big birds. *They come with the Fantails and not with the Pintails.* By the middle or end of February the Pintails begin to come back, and in March there are three Pintails to one Fantail, but I have never shot one of these snipes later than the 19th February, that is to say, never during the northern migration of the Pintails."

From the inquiries I have made from sportsmen, there seems to be a very general idea that there is a form of Pintail which differs from the ordinary birds in being much larger, but an examination of the skins sent to prove this shows that these birds are nothing but very large specimens of the ordinary Pintail. I can see no single point about them beyond their unusual size by which one can discriminate them, though, as already observed, these very large birds seldom, if ever, have more than twenty-two feathers in their tails. This difference in size is perhaps even more noticeable in bulk than

it is in wing and bill measurements. It must also be noted that Mr. Val Weston has remarked that the colour of these birds' legs is a far clearer brighter yellow than is the case with ordinary Pintail.

Distribution.—There is not much to add to Blanford's note on the distribution of this species, which is as follows:—

“The Pintail Snipe breeds, as far as is known, in Eastern Siberia as far west as the Yenesei Valley, and migrates in winter to South-Eastern Asia and the Malayan Archipelago. It is very rare in the Punjab, Sind and the North-Western provinces, Rajputana and Gujrat; but increases in numbers to the southward and eastward, and is found throughout the Peninsula in winter, predominating in Mysore and Southern India, whilst in the high land of Deccan, in Bombay and the Central Provinces and even somewhat further south, the Common Snipe is more abundant, and whilst in Orissa and Bengal the two species are on the whole equally distributed everywhere, further east, in Assam, Sylhet, Cachar and throughout Burmah, *G. stenura* is the snipe of the country.”

In Ceylon it should be noted that whilst the Fantail is comparatively rare, the Pintail is extremely plentiful.

An interesting note sent me by Mr. T. M. Saunders on snipe shooting in Burmah is interesting on account of the fact that it contradicts so many accepted things:—

“I first began to note roughly the proportions of Pintail to Fantail Snipe when I was in Burmah shooting at and in the vicinity of Mandalay. In my shooting diary there are frequently notes such as ‘ $\frac{3}{4}$ Fantail,’ ‘over $\frac{1}{2}$ Fantails,’ etc., and taking the average wherever these notes occur, it works out at roughly two Fantails to each Pintail. These figures, though very rough, are fairly accurate, as the proportions were very constant, and in no case is there a note to the effect that the number of Fantails was below that of the Pintails.

“The ground worked over was mainly paddy-fields, but there was also much grass land, flooded areas, jheels, edges of creeks, canals, etc.”

It must be remembered that Blanford gives the Indian distribution in its widest sense. Throughout the Eastern portion of its Indian range the number of Pintail compared with Fantail varies very greatly in accordance with seasons, and sportsmen have to be very careful how they form their opinions on this subject.

The Pintail, without doubt, enters India *via* the Eastern Himalayas, comparatively few coming through them even as far west as Nepal. The Fantail, on the other hand, though migrating principally

from the west, comes also in some numbers over and through the eastern ranges. But the Fantail arrives later than the Pintail, so that to the east the Pintail predominates enormously during the early and late periods of its stay in India, that is to say, just after and just prior to its migration.

In this way a sportsman who shoots in Cachar in September may find nothing but Pintail in his bag, whereas one shooting in the same district in December may find but few Pintails and nearly all Fantails.

Nidification.—Very little is known about the nidification of the Pintail Snipe, though very recently Dresser has obtained its eggs through Russian collectors.

Seeböhm visited its breeding grounds when it commenced to arrive in the first week of June, but he appears to have left before it began to nest.

Prjevalsky gives a good account of its breeding on the Ussuri under the name of *G. heterocerca*. He says:—

“In the latter half of April the birds choose their nesting localities in the thinly overgrown marshes, and their peculiar courting commences. Rising into the air similar to our *G. scolopacina*, and describing large circles above the spot where the female is sitting, it suddenly dashes downwards with great noise (which is most likely produced by the tail feathers, like that made by our species, and somewhat resembles the noise of a broken rocket). As the bird approaches the ground, the noise increases until it has got within a hundred yards, when it suddenly stops the sound and quietly flies on, uttering a note sounding something like *Tiric, tiric, tiric*. Courtship lasts until the middle of June, and is mostly heard or seen in the mornings and evenings, but occasionally in the daytime and even at night in the clear weather.”

Gyldenstolpe says that “it probably breeds in Siam,” but this is hardly likely, although an odd bird or so may remain to breed in the higher ranges of the hills to the north.

I was fortunate enough to take an undoubtedly authentic nest of this snipe on the 21st June, 1890, at Guilang in the North Cachar Hills. Some Nagas brought me a pair of snipe, which they had trapped in a wide ditch surrounding a deserted stockade, and on a search being made in the banks of this ditch, a nest with four eggs was discovered. The two birds *appeared* to be quite sound in every way, but it is almost certain that one or both of them must have

received some injury which prevented it migrating to its usual nesting ground, though it had left the plains with the intention of going there.

The bottom of the ditch in which the nest was placed contained a little water, but the banks were only slightly moist and spongy, and where the nest was placed, in amongst the roots of long grass, it was quite dry. The nest was a circular pad of fine roots and grasses with a depression in the centre of about half an inch. It was curiously well and compactly put together, though there was no attempt to weave or intertwine together the articles of which it was composed.

The eggs, which were fresh, were four in number, and averaged 1.48×1.12 inches ($= 37.5 \times 28.4$ mm.). The ground colour is a very pale, but rather bright yellow stone, and the markings consist of very bold blotches and spots with one or two long scriggly lines of deep vandyke brown. These are nearly all confined to the larger third of each egg, only a few spots and specks being present in the smaller two-thirds. The underlying marks consist of blotches of purplish grey scattered about the egg in the same proportion as the primary markings.

The texture is fine and close, and there is a fair gloss: the shape is the usual broad peg-top of all snipes' eggs.

Mr. H. A. Hole wrote me in 1890-92, that he was sure that a certain number of snipe bred every year in the plains of Cachar, and that he had frequently put up snipe in the newly ploughed fields in June, July and August.

In 1890 and the following year he failed to obtain any eggs, but on the 14th June, 1902, he got, amongst a great number of painted snipes' eggs, a clutch of three and a single egg, which are undoubtedly true snipes' eggs and almost equally certainly those of the Pintail.

In both these cases the nests were found on the *bands* or banks bordering rice-fields and were placed at the water's edge in dense grass and weeds. The rice-fields in this part of Cachar are very small, and consist of the low ground running between and around the small broken hills at the foot of the higher ranges. They are, as usual, divided by narrow banks of a foot or two in height, but in country of this character the borders of the fields and the

banks themselves are always much overgrown with grass, weeds and small bushes.

All four of these eggs are of the same type as those described above, merely differing in having a somewhat greener ground-colour, and the markings rather less heavy and more evenly distributed. They average 1.58×1.11 inches ($= 40.1 \times 28.1$ mm.).

I have also an oviduct egg in my possession which was taken in the early part of August, 1889, from a female Pintail shot by someone in Cachar on the *Bheel* surrounding the rifle range. The bird was dissected and the egg sent me by the late Colonel Evans, I.M.S., at that time attached to the regiment stationed in Silchar.

This egg differs from all others I have seen in being very dull in colour and curiously brown in general hue. The markings are like those in the Silchar ones, but have the distribution reversed, i.e., they are principally confined to the smaller instead of the larger end.

The underlying spots are also unusually dark, and are of a purplish-brown. The egg measures 1.55×1.14 inches ($= 39.3 \times 28.9$ mm.).

Another oviduct egg was also obtained in Cachar from a Pintail Snipe. I think this was in August, 1887 or 1888, but am not sure of the date, and the shell being still soft, the egg was not preserved.

An oviduct egg is also to be seen in the Colombo Museum (*vide* Wait) taken from a female shot late in the season in Ceylon.

General Habits.—In Eastern India the Pintails arrive early in August, but there are a few records of snipe being killed in July. Fasson writes *in epistola* to Hume:—

“I have flushed snipe in the hill jungle in June; and Jarbo, up at Rangamati in the hill tracts, shot half-a-dozen couple on the 31st July last.”

Those seen in June were probably birds which had been wounded, and therefore unable to migrate, whilst the occurrence of the others in July must have been abnormally early. The record of the first snipe to be shot each year in the Chittagong district has been given by “Politye” in the ‘Indian Field’ of 9th July, 1903, for the years since 1878, and according to this record the next earliest dates to those mentioned by Fasson were on the 6th August, 1892,

and 1st August, 1886. Mr. Val Weston says that the Pintail Snipe sometimes puts in an appearance in Birbhum in the last few days of July, but does not seem to have shot any in that month, and such appearances must be unusual, for in 1903 he records the first snipe as being shot on the 23rd August.

"Raoul" in the 'Indian Field' of the 26th July, 1909, records having seen three snipe on the 20th of that month, and again in 1873 he saw snipe on the 13th July; but these notices of seeing snipe can hardly be taken into consideration as actual records, for there is always the *possibility* of other little waders having been taken for them. On the other hand it must be noted that Wait in 'Spolia Zeylanica' says that in Ceylon the first few birds arrive in the end of August or beginning of September, and that they leave again about mid-April.

In Dibrugarh the first few birds arrive about the 4th August, in Chittagong about the same time, in Cachar, in Jalpaiguri and the Himalayan Terai they arrive about the 12th of that month, and in Nepal a little later still. Thence they work south and west, arriving in Ceylon in October, and seldom before the end of that month in any numbers.

The maps which accompany this article will show how the distribution of the Pintail and Fantail overlaps, as well as the approximate dates on which the earliest individuals of each species arrive at their respective destinations. The routes are marked in red, and from these it will be seen that the Pintail seems to move more diagonally, that is, more south and west than the Fantail does south and east, and also to migrate further south as a body. Thus at no period of its stay in India is the Fantail altogether absent from the northern portion of its range, but in December and January hardly a Pintail is to be found in the extreme north-east of India, nearly all the birds having gone further south by that time. In February they recommence working north, and by March have again deposed the Fantail from its position of numerical superiority in north-eastern India.

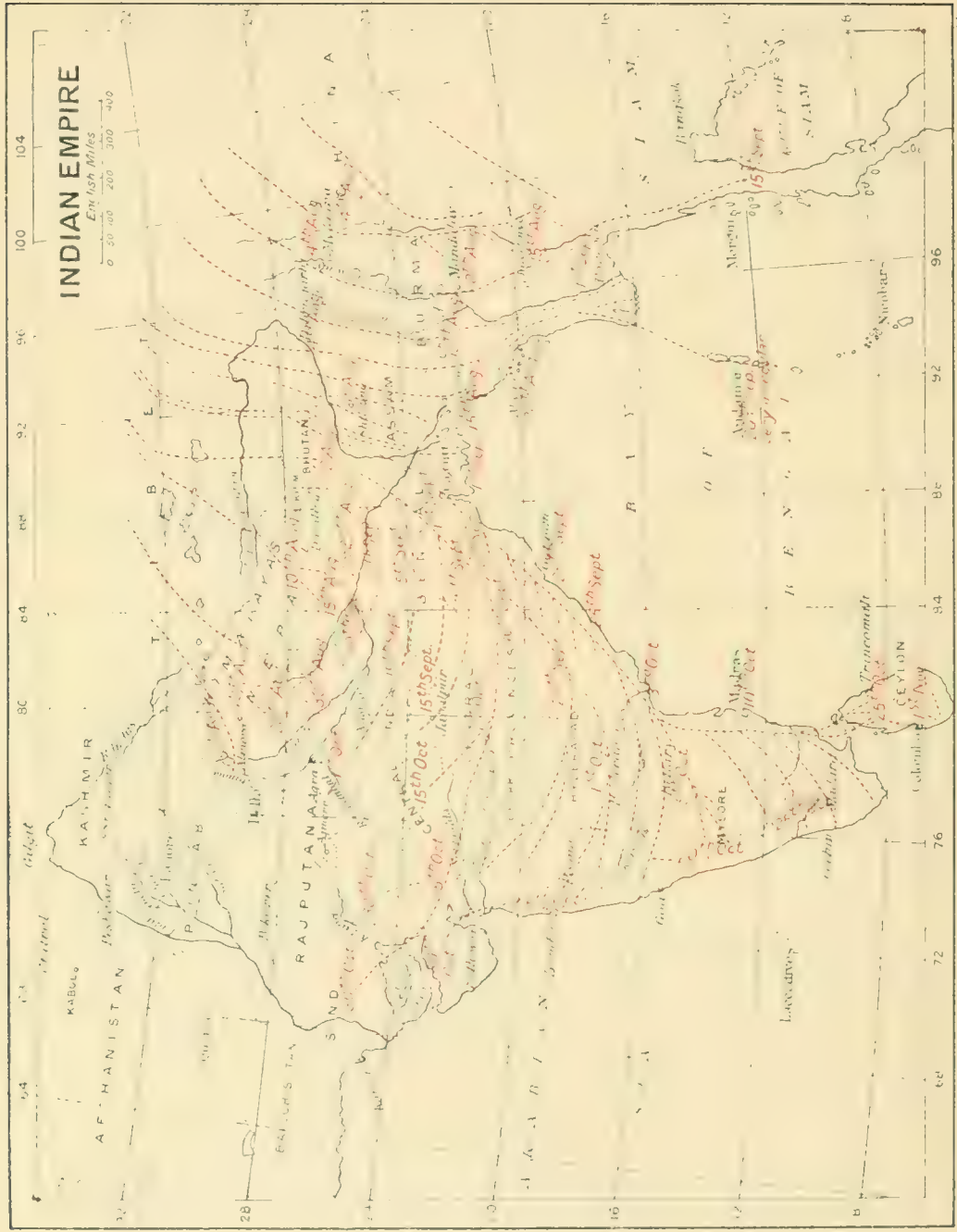
The Pintail is as nocturnal in its habits as are other snipe, and like the latter normally migrates by night, but a curious instance of diurnal migration has been reported to me by Mr. L. W. Middleton. He writes:—

“On September 8th I went out in the morning to see if the snipe were in and shot six and put up over thirty; so, in the afternoon about five o'clock, I again went out, thinking I was going to have a merry time, but I only saw three, and of those two rose straight up and joined a wisp of eight or ten which were crossing over at the time. I only found two more and then sat down to watch, and whilst so doing actually saw five rise and join flights of others which were passing over. I saw fully ten small lots come into view and make across the hills in a south-westerly direction. Next morning I went down early and trudged for an hour without putting up a bird, but I must have seen several hundred crossing overhead, one lot alone numbering fifty to sixty birds. The day was a bright sunny one, and exceptionally hot.”

Mr. Middleton's letter was written from Gauhati, and the hills he refers to are the Khasia Hills. It is interesting to note how he remarks on these snipe working from one hill range to another instead of down the valley in which he was shooting.

The Pintail Snipe differs a good deal from the Fantail in its habits, and will often be found in situations never frequented by the latter except when driven there by heat or by being over-shot. Very favourite haunts of the Pintail in Assam are the wide waste lands of sun grass worn down by village buffaloes to an average height of some eighteen inches, here and there the land being almost bare, whilst in patches elsewhere the grass may be three or four feet high. During the rains, water, often to a considerable depth, covers these spaces, but by October and November they are practically dry, and even in the rains there are nearly always portions which are a little above water level. The Pintail Snipe shelter and feed in these grasslands, keeping almost entirely to the drier portions, though if the right kind of food is present, they also frequent the wet patches and the marshy bits which are dotted about over the whole of the area. Hume remarks on the feeding ground of the Fantail and Pintail as follows :—

“Both the Pintail and Fantail affect cover and moist ground, so that where both these luxuries exist, you will continually flush both species at the same spot; but the difference between them is that, while the Pintail, if unable to get both his requirements, will stick to grass and such-like cover, even if there be little perceptible moisture in the ground, the Common Snipe in such case will stick to the wet ground even if there be little perceptible cover there. The consequence



MIGRATION ROUTES OF THE PINTAIL SNIPE (*GALLINAGO STENURA*)
WITH APPROXIMATE DATES OF ARRIVAL

is that whilst you often get both birds in precisely the same ground, you will often find the Pintail apparently quite at home in dry grass-land, stubbles and scrub jungle where the Common Snipe would never, except accidentally, occur, and again you will find the Fantail on almost bare mud banks of rivers and tanks, where it is the rarest thing in the world to meet a Pintail."

Personally, I do not think that cover is so great a necessity to the Pintail as Hume would suggest; the fact is that a great part of this bird's food consists of tiny shells, insects and other objects found for the most part on dry land and not in water or mud; accordingly the bird frequents dry quite as frequently as wet land, naturally preferring to get cover as well when that is possible.

Mr. H. A. Hole found snipe (undoubtedly the Pintail) feeding in absolutely bare ploughed fields in Cachar. I have myself shot them in Dibrugarh in mustard fields, from which the crops had been cut, and every year numerous birds are shot on the race-course of that place on practically bare, but wet, grassland, the grass being but an inch or two high.

Mr. C. E. Milner, I.F.S., writing to me from Bassein in Lower Burmah, says:—

"Since February 10th I have been marching more or less along the West Coast of Burmah in the Bassein district south of Arakan, and lat. 17°, and I have seen a fair number of Pintail Snipe along the foreshore. Between the shore and the hills or cultivation, there is a strip of 50 or 100 yards of flat sand-bank covered with short grass and with here and there a small slightly moist hollow, but there is no water and no mud except in the mangrove swamps or in an occasional buffalo wallow. On March 22nd, marching along this sandy shore, I put up several snipe and Golden Plover, and of the former only one got up off the seaweed at high-water mark, the rest got up and settled again on this dry sandy strip, although the sun was very hot and there was practically no shade. I afterwards bagged four couple out of one small buffalo wallow and altogether there must have been between fifteen or twenty couple of snipe on the fifteen miles or so of sandy shore. They were all Pintail and quite plump, and quite as good to eat as snipe shot elsewhere at any other time."

In Bengal, the most common resort of both Pintail and Fantail is paddy cultivation and shallow *bheel* land which is covered with vegetation of some kind, but whereas the Fantail never leaves this

under ordinary circumstances, the Pintail will also often be found on adjoining dry grass lands and even in jungle.

Snipe shooting is much the same whether one is after Fantail or Pintail, and in Bengal in nine cases out of ten one covers the same country in pursuit of either or both.

Hume seems to have had unfortunate experiences in Bengal, for he writes:—

“ In one single spot in the Meerut district, on the Boorka Ganga, in the neighbourhood of Hastinapur, to my certain knowledge, over 700 couple of Common Snipe were bagged during December, 1850, by different parties who visited the place . . . I have never heard of any one place in Bengal, Burmah or Southern India where anything like this bag of Pintail could have been made by any number of guns.”

This statement of Hume's is, of course, very far wide of the mark; in Bengal there are many such places, in Assam a few, and in Burmah and Orissa others.

In the Sundarbans of Barisal, Khulna and Jessore there are many wide stretches of mingled *bheel* and rice cultivation where a party of seven guns would *have to shoot very badly* in order to miss getting 700 couple in ten days' shooting. In the famous Kanchrapara jheels in the eighties and nineties, 100 couple of snipe to one gun has often been exceeded in a day's shooting, and this country was so well stocked that it stood shooting day after day. I well remember shooting there once in 1883 with three other guns. We unfortunately missed an overnight train, and in consequence arrived late, so that when we got to our ground we found that the two best beats were already taken. In spite of this, our bag that day was 170 couple, whilst the other parties of shooters, who came into the station as we were waiting for our return train back to Nadia, showed sticks as follows: the first party of three guns 180 couple, the next party of two guns something over 100 couple, and a third party of four very bad shots, 48 couple. Here was a bag of something over 500 couple for one day, and I believe one might have gone on shooting at the same rate for many days.

I do not think it is any exaggeration to say that in the season Kanchrapara must furnish over 1,000 couple of snipe month after month.

Shooting in Nadia in 1883 when I was stationed in that district, 40 to 80 couple was not considered a heavy *morning's* bag for a couple of guns; in Hooghly the same, and in some of the rice-fields quite close to the station bags of 75 to 125 couple to two guns were almost a common occurrence. Indeed in any of the good snipe districts of Bengal one does not call anything under 50 couple to one gun a good bag for a whole day's shooting.

In Orissa, I know of several bags of 100 couple to one gun obtained in places which could have held several guns for several consecutive days. Thus Mr. H. Cornish, to whom I have already referred, is credited with beating 100 couple twice in a week on the same ground near Cuttack.

Mr. H. Reily is said to have shot over 100 couple to his own gun in the same district, and in Burmah also over 100 couple has been obtained more than once. Shooting grounds such as these would furnish far more than 700 couple of snipe in a month unless the powder were of a very curious quality.

In Ceylon the record bag already referred to was that obtained by Captain George Rice on the 16th February, 1893, when $103\frac{1}{2}$ couple fell to his gun. Captain Rice *in epistolâ* also sends me the records of five other days when he shot over fifty couple of snipe to his own gun, and he adds :—

“I could often have killed more except on the 16th February, when I shot as long as I could see. I am inclined to believe that snipe have diminished in numbers in Ceylon.”

In some of the big Sylhet swamps bags of over 100 couple of snipe to parties of three or four guns are sometimes made, but there are few grounds which would give four guns 500 couple in twenty days' shooting.

Cachar and the Assam Valley are even less productive of sport; in the former bags of fifty couple to a single gun are unusual, and in the latter, though one comes across birds almost in thousands on rare occasions when they are migrating, the shooting is so difficult that big bags are exceptional; at such times also the birds themselves are on the move, so that where one day the sportsman cannot shoot and load fast enough, the next day he may not be able to scrape together five couple in five times that number of shots.

On one occasion I happened to be duck shooting in North Lakhimpur in the extreme east of Assam, when an enormous flight of snipe came in, both Pintail and Fantail. The day previous we had been duck shooting over the three principal *bheels* of that part of this district, perhaps putting up some twenty or so snipe in the course of a twelve-hours' shoot, but after their arrival we could hardly move a dozen yards without putting up one or more of them. That evening, shooting round the skirts of the *bheel*, two guns picked up forty-two couple, and found the birds so numerous that we decided to devote the following day to them alone.

The ground we were to shoot over had once been high forest land which had sunk until it formed a swamp in which there were some three or four feet of water all the year round. The trees had, of course, all died, but the stumps of many of the harder-grained ones were still standing, white and bleached and looking like the ghosts of their former selves. In the centre of these swamps shooting on foot was impossible as the water was still too deep, but all over the more shallow parts grew a dense mass of floating weeds a couple of feet thick and quite firm enough to walk on with care. There were three guns to take the field on this occasion, *viz.*, myself, a second, who was an average but careful shot, and a third, who could be called nothing but a rank bad one.

Before we got into the swamp itself, we picked up a couple of teal and two snipe out of pools at the edge, and as soon as we got on the weeds away went snipe in every direction. At first the shooting was easy, the weeds firm and the water shallow, and our first dozen shots or so collected eight birds, but after this we got into deeper stuff, and the shooting got worse and worse. The birds still swarmed on all sides, but they were rather wild, and the weeds, though strong enough to hold us as long as we moved, gave way when we stood, so that our "foreleg," on which the weight was, sank as we fired. Sometimes we sank slowly and fired after a fashion, sometimes we sank with a sudden disconcerting splash, it might be a couple of feet, or it might be four, and sometimes it was even more than this.

It was very exhausting work, and after a couple of hours, having the fortune to get on a small island, we called a halt and looked at the bag. C., the bad shot, had fired forty-two shots and had not a

feather to show. Y. the cautious man, had had thirty shots to twelve dead birds, and I myself, shooting at everything within range, got eighteen birds to sixty-five cartridges. After a short rest we tramped on once more, but C., after loosing off another forty cartridges or so and bagging one bird, fell into a buffalo wallow up to his neck, and on being extricated from this struck work and cleared off. Y. and I persevered after we had lunched, but with no better results until we struck a piece of good walking, and here Y. collected five birds in seven shots, and I was so fortunate as to get eight consecutive kills. Then we got into deeper stuff again, and the average kills per cartridge again dropped. Eventually, after the most exhausting day's shooting I have ever had, we struck work at about 4 p.m. and totted up our bags. C. had, before ceasing, fired eighty-three shots for one bird, Y. who had picked his shots all day, had got forty-four birds in exactly 100 cartridges, and I had managed to collect sixty-eight snipe in 204 shots, but of these sixty-eight, two I had shot before we started working the deep water, and eight I had got without a miss on a clean piece of walking, so that really I had expended 194 cartridges in killing fifty-eight snipe. It was no question of want of birds or of bad shooting as far as Y. or myself were concerned, it was just the difficult walking and perhaps, to some extent, the attendant exhaustion. Each step one took, one was sinking more or less slowly the whole time, with the consequence that the gunner was twice in every three shots under his birds.

The following day we abandoned the deep water altogether, and Y. and I worked round the edges and then across shallow stretches linking one swamp with another. In this way, although we did not put up one-tenth the number of birds we had on the previous day, we managed between us to pick up over fifty couple in under 200 cartridges.

The supposed differences between the Fantail and the Pintail in the matter of flight and voice have been much discussed, but I am ashamed to say that to this day I cannot tell one from the other when on the wing, nor could I ever, with any certainty, say what the bird was from its cry.

Other sportsmen and field naturalists, however, seem to find no difficulty in discriminating between them. Hume gives his own opinion as follows :—

"I individually am certain that all conditions being identical, the flight of the Pintail is more laboured and more direct and less zigzaggy than that of the Fantail.

"As to the notes of the two birds, I am at a loss to understand how anyone can assert that they are identical."

At this point Hume stops and forgets to tell us how to say what cry belongs to which bird. Some of his correspondents try to show in what they consider the difference exists. Stuart says:—

"It rises with a sharp loud cry unlike the ordinary snipe and its flight is heavier."

Parker says that the Pintail has a more laboured flight than the Fantail.

Brooke also *thinks* that the cry is different and the flight rather slower and not so zigzag.

On the other hand we have observers like Baldwin, Scully and Butler, all declaring that they can find no difference in voice or flight between the two birds.

That some men can tell the difference is a fact, as I found out one day at the cost of one rupee per bird. I was shooting with a friend, who called out as a bird dropped, "Hallo, that's a Pintail." It was so right enough, but my sceptical nature made me think it was a fluke his guessing correctly, and I told him so. Thereupon he bet me a rupee a bird that he would name the next ten birds he should kill, and this he proceeded to do perfectly correctly and named, as they fell, six Fantail and four Pintail. This sportsman, however, said that the voices were identical, but that the Fantail got up vertically and then cleared off, whilst there was a perceptible pause as it changed direction; the Pintail, on the other hand, rose on a slant and kept going. He had never noticed any difference in their zigzagging, as Hume calls it.

What is the best weapon for snipe? A difficult question to answer, and to every sportsman the answer would not be the same. Hume, we see, advises a 20- or 24-bore with a dram of powder, but this necessitates the man behind the gun being a brilliant shot and also the snipe being comparatively domestic in their habits. For a long day's shoot there is no doubt that the lighter the gun carried, the less tired the shooter will get, and the less his shooting will deteriorate

by the end of the day. There are few men, however, who are not strong enough to use a 16-bore throughout the longest day; personally, though I rejoice in but one arm, I find a 16-bore perfectly manageable at the end of the hardest day's tramp; and though I used a 20-bore one season, I dropped it because I could not shoot straight enough with it, and also found that when snipe were wild it did not kill the birds hit, the range of the weapon being insufficient.

The probable answer to the question is, let each sportsman find out what suits him best, and when he has found out stick to the weapon as long as he can. If he starts with no bias for any special bore, let him commence his shooting with a 16-bore, and he will *probably* eventually find this light enough to carry, yet giving a sufficiently good pattern and with enough penetration to satisfy all his wants. I would not, however, ever advise a youngster to start with a 20-, much less with a 24-bore.

On the table the Pintail does perhaps often rank as inferior to the Fantail. At their best the two birds are indistinguishable, but after a drought and when shot in scrub, the Pintail is often comparatively dry eating, a result which might be expected from the diet on which he has been living.

The bill of the Pintail Snipe is not nearly so sensitive as that of the Fantail, and accordingly, we find him feeding far more on comparatively dry ground, boring less in the ground and indulging more on whatever he can get above it. A very large proportion of his diet consists of tiny snails and similar "shell-fish" which are to be found in and about the roots of grass, &c., on damp ground, or else climbing up the blades to some height. But besides these and the worms, caterpillars and other soft items of food, all of which are also eaten by the Fantail as opportunity arises, the Pintail will eat grasshoppers, small beetles, and other equally hard substances, and I have shot birds in dry scrub with the stomachs full of a small kind of flying ant.

GALLINAGO MEGALA.

SWINHOE'S SNIPE.

Gallinago megala, *Swinhoe, Ibis*, 1861; *Legge, B. of Cey.* p. 817; *Oates, Game-B.* ii, p. 475; *Sharpe, Cat. B. M.* xxiv, p. 624; *id. Hand-L.* vol. i, p. 165; *Dresser, Bull. B. O. U.* No. 25, p. 39; *Indian Field*, 8th October, 5th, 12th, and 16th November, 1903; *Harington, Rangoon Gazette*, 19.6.11; *Stuart Baker, J. B. N. H. S.* xx, p. 595; *Venning, ibid.* xxi, p. 269; *C. Gwyer, ibid.* xxii, p. 804; *Bloch, ibid.* xxiii, p. 778.

Scolopax megala, *Seeböhm, Charadriidæ*, p. 479.

Description. **Adult Male.**—Swinhoe's Snipe is in colouration indistinguishable from the Pintail Snipe, but can always be identified by an examination of the tail. This in Swinhoe's Snipe contains only twenty feathers, whereas the Pintail Snipe normally has twenty-six tail feathers and practically never less than twenty-two. Even, however, when the tail is imperfect, discrimination is easy, for whereas the outer tail feathers of the Pintail are hardly broader than a pin, those of Swinhoe's Snipe are never under 0·2 inches. Again the Pintail has eight or ten of the central feathers non-attenuated, whereas Swinhoe's has only the six central ones showing no attenuation. The white tips to the tail feathers are more conspicuous than in the Pintail Snipe.

Colours of Soft Parts.—"Bill light yellowish-brown for the basal two-thirds, yellower on the base of the upper mandible, blackish-brown on the apical third; feet light yellowish-grey, with blackish-brown claws; iris dark amber brown." (*Swinhoe.*)

Measurements.—"Total length 9·5 inches, culmen 2·3, wing 5·4, tail 2·15, tarsus 1·35." (*Sharpe.*)

Two adults in the Calcutta Museum from Foochow have wings of 5·42 and 5·45 inches (= 137·6 and 138·4 mm.), respectively.

Adult Female.—Similar to the male, but rather larger, "legs and feet pale bluish-grey, nails black" (A. E. Everett). A bird sent me from the Shan States has the legs rather bright yellowish-grey. The wing measures 5·64 inches (= 143·2 mm.) and the skin is almost certainly that of a female.

Measurements.—Total length 10·5 inches, culmen 2·62, wing 5·6, tail 2·15, tarsus 1·35." (*Sharpe*.)

Young Birds.—"As with *G. stenura* so with the present species, the young birds appear to be distinguishable by their more uniform dark brown chest and throat; the stripes on the sides of the crown are also black and not mottled with rufous." (*Sharpe*.)

Normally Swinhoe's Snipe is a bigger bird than is the Pintail, but the difference in size is not sufficiently marked to make it a factor of any use for the purposes of identification. Thus a specimen of the former in the Calcutta Museum, probably a young bird, has the wing only 5·08 inches, whereas the Pintail often has the wing up to 5·5 inches.

Distribution.—*Gallinago megala* breeds in Eastern Siberia and Northern China, migrating south in winter to Southern China, the Philippines, Borneo and the Moluccas. It is possible also that it breeds in Japan, though Alan Owston tells me that he has so far never heard of its doing so.

Up to 1910 the records of its occurrence within the limits of the present work were two only in number. A skin of a bird, already referred to, was sent me from the Shan States in December, 1908, and a second was shot by me in Dibrugarh in January, 1903.

Since then there have been numerous records, nearly all from Burmah. Harington, in the Rangoon Gazette, records receiving a skin of this snipe from Captain Venning, which the latter shot at Myitkyina in January, 1910, and he also notes that Mr. H. Blanford shot a specimen on the 7th March, 1910, in the Katha district.

Another specimen was shot by Mr. J. P. Cook, at Thayetmyo, on the 3rd October, and two others by Mr. C. S. Barton on the 29th September, 1911, at Maing Kaing, Upper Chinwin.

Both of Mr. Barton's birds were shot in young paddy, the latter in company with twelve Pintail and eight Fantail.

Mr. C. Gwyer, I.F.S., obtained a specimen of this snipe at Tharrawady, Lower Burmah, on the 5th November, 1913, Captain Venning also shot one at Pyawli in 1911, and Mr. Bloech records seeing and obtaining several Swinhoe's Snipe round Rangoon. He says:—

"I saw and obtained several Swinhoe's Snipes (*C. megala*), though on the whole they are rare; I am inclined to think that

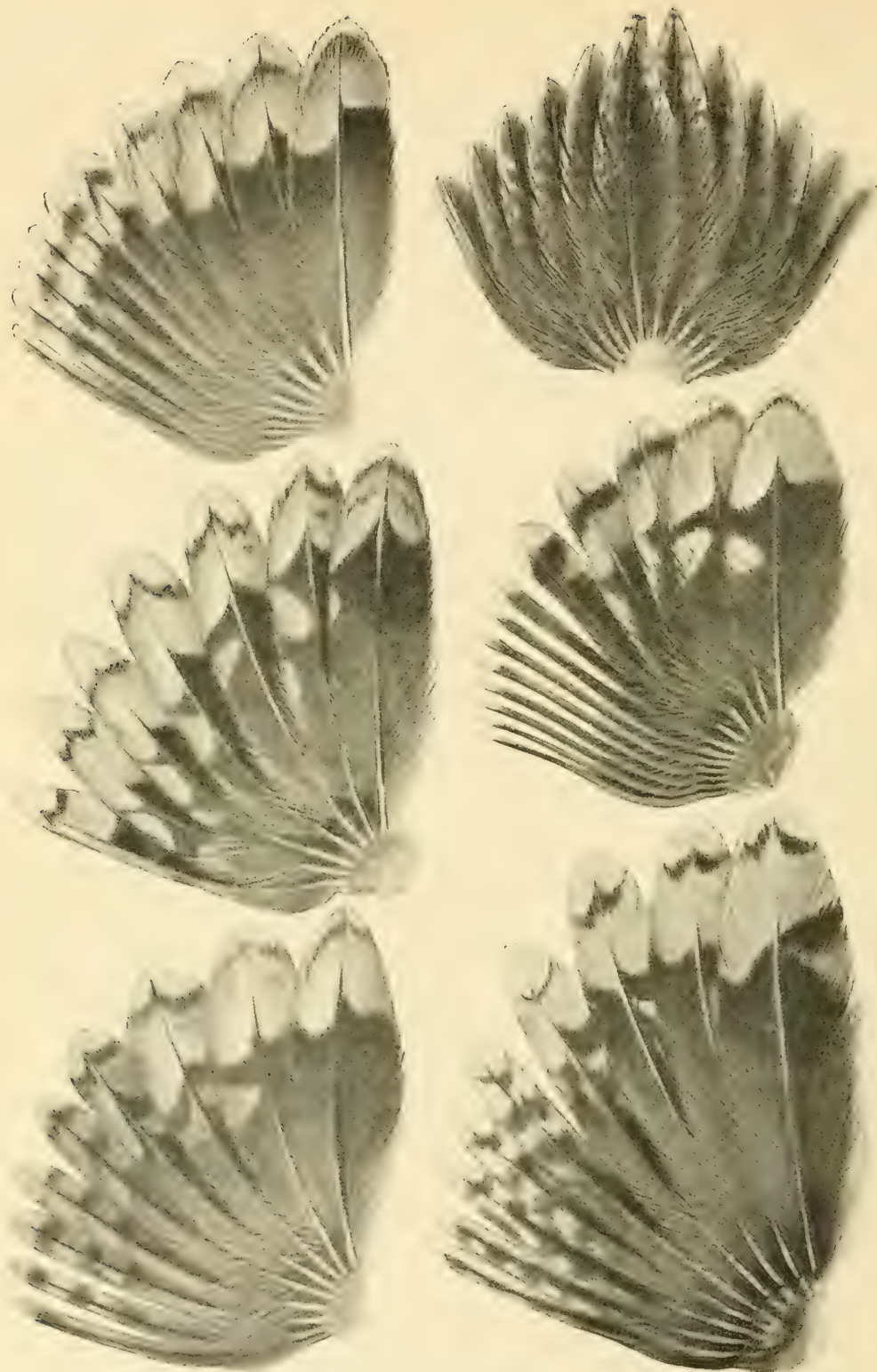
they show a decided penchant for jungle ground. The last I shot, 26th December, was obtained near Palon, about fifty miles up the Promé railway line, on the edge of a large jheel (Hlahama gret-su) situated in the middle of thick jungle."

Mr. L. S. Fraser writes as follows from 17, American Street, Madras, to Mr. Millard:—

"There were several specimens of this snipe shot in Madras this season, all in the Chingleput district, Mr. Stoney had two, my partner, Mr. Graham Ross, shot one, and I had three" (26.4.1912).

This snipe is essentially a far eastern form, but there is no reason why it should not be found fairly constantly in Burmah, and also, occasionally, in Assam and the extreme East of Bengal. Unfortunately *casual* examinations of big bags of snipe are of no use in ascertaining whether specimens of *megala* form a part with others, but if sportsmen will take the trouble to examine really carefully the tail of those shot, there can be but little doubt that we shall soon obtain further records of its visiting India, more especially in its extreme eastern limits.

There is practically nothing on record about this snipe, although it is common enough in its own habitat. It is only within the last two years that its nidification has become known, and even such records as these are confined to Russian works. Dresser informs me that he has received eggs from Buturlin which were taken in Eastern Siberia, and he exhibited some of these at one of the dinners of the British Ornithologists' Union.



TAILS OF SNIPE.

1. SWINHOE'S SNIPE (*G. megala*). Note 20 tail feathers, outer 12 attenuated.
2. PINTAIL SNIPE (*G. stenura*). Note 26 tail feathers, outer 16 much attenuated.
3. FANTAIL SNIPE (*G. gallinago*). Note 14 tail feathers, none attenuated.
4. WOOD SNIPE (*G. nemoricola*). Note 18 tail feathers, outer ones narrow.
5. EASTERN SOLITARY SNIPE (*G. solitaria*). Note 18 tail feathers, outer 6 narrow.
6. JACK SNIPE (*G. gallinula*). Note 12 tail feathers.

GALLINAGO GALLINULA.

THE JACK SNIPE.

Scolopax gallinula, Linn. S. N. i, p. 244 (1766); Seebohm, *Charadriidæ*, p. 480.

Gallinago gallinula, Blyth, *Cat.* p. 272; Jerdon, *B. of I.* iii, p. 676; Hume, *S. F.* i, p. 235; Adam, *ibid.* p. 395; Butler, *ibid.* iv, p. 15; Fairbank, *ibid.* p. 263; *id. ibid.* v, p. 410; Hume & Dav. *ibid.* vi, p. 459; Dav. & Wendon, *ibid.* vii, p. 88; Ball, *ibid.* p. 228; Cripps, *ibid.* p. 302; Hume, *ibid.* p. 484; *id. Cat.* No. 872; Scully, *S. F.* viii, p. 356; Legge, *B. of Cey.* p. 828; Hume & Marsh. *Game-B.* iii, p. 373; Vidal, *S. F.* ix, p. 89; Butler, *ibid.* p. 428; Reid, *ibid.* x, p. 69; Eden, *ibid.* p. 165; Davidson, *ibid.* p. 320; Davison, *ibid.* p. 314; Taylor, *ibid.* p. 465; Oates, *B. of B. B.* ii, p. 384; Barnes, *B. of Bom.* p. 346; Hume, *S. F.* xi, p. 321; W. Gaye, *J. B. N. H. S.* vi, p. 418; Stuart Baker, *ibid.* xii, p. 501; A. L. Butler, *ibid.* xiii, p. 149; Inglis, *ibid.* xiv, p. 771; Marshall, *ibid.* xv, p. 354; Wall, *ibid.* p. 72; Macdonald, *ibid.* xvii, p. 500; Dresser, *Pal. Birds*, ii, p. 763; Blanford, *Avifauna of B. I.* iv, p. 292; Bahr, *Ibis*, 1907, p. 29; Dresser, *Eggs of E. B.* p. 690; Finn. *In. Waders*, p. 150; Bahr, *P. Z. S.* June, 1907, p. 28; Harington, *J. B. N. H. S.* xix, p. 311; Bloech, *ibid.* xxiii, p. 777; Delmé-Radcliffe, *ibid.* xxiv, p. 166 (1915); Currie, *ibid.* p. 575 (1916); Wait, *Spolia Zeylanica*, x, p. 239 (1916); Stoney, *J. B. N. H. S.* xxv, p. 306 (1917).

Limnocryptes gallinula, Sharpe, *Cat. B. M.* xxiv, p. 665; *id. Hand-L.* i, p. 166; Oates, *Game-B.* ii, p. 131; *id. Cat. Eggs, B. M.* ii, p. 66.

Vernacular Names.—*Chota Chaha* (Hin.); *Chota Bharca* (Nepal); *Olan* (Tamil); *Tibad, Pan Kawa* (Mahrati); *Daodidap Gajibu* (Cachari).

Description. **Adult Male.**—Crown to nape velvety black, stippled with rufous, a very broad supercilium pale buff; sides of the head dull white marked with rufous-brown, and two broad brown streaks running from the bill, the upper through the eye, the lower under the ear-covert. Hind neck rufous stippled with white and dark-brown; back, scapulars and rump black, glossed with purple and green, varying in different lights, the outer webs of the scapulars buff, forming two bands, and the inner more or less barred with rufous; upper tail-coverts and tail dark-brown with rufescent-buff borders. Lesser and median wing-coverts deep-brown or black, with very pale

buff or white bars, greater coverts dark-brown tipped white, wing quills dark-brown, the first primary pale on the base of the outer web, and the secondaries tipped with white. Chin white, neck, breast and flanks mixed white, brown and rufous, the brown predominating; abdomen and lower breast white, under tail-coverts with dark shaft-streaks. Under wing-coverts white barred with brown on the edge of the wing; axillaries white, sometimes slightly barred with brown, but generally pure white.

Adult Female.—Similar to the male.

Winter Plumage.—“Scarcely to be distinguished from the summer plumage, except by the greater amount of blackish mottling on the hinder-neck and the generally more rufescent colour. The pale bands on the back are lighter [*sic* brighter?] but soon fade with exposure, and wear the paler tints of the spring and summer dress.” (*Sharpe*.)

Colours of Soft Parts.—“The legs and feet are pale greenish, at times with a bluish or greyish shade, generally more or less olive or yellowish; the claws blackish-brown; the irides deep brown; the bill is blackish-brown at tip, and darkish-brown on nares, and along the commissure; the rest paler, sometimes a pale grey-brown, sometimes with a fleshy tinge, and sometimes with a dull bluish or slaty tinge, especially towards the base of the lower mandible.”

Butler calls the colour of the feet “pale olive-green.”

Measurements.—There appears to be no difference in size between the sexes or in the colouration of the soft parts. Hume thus writes of this little snipe:—

“I cannot discover any constant or average difference in the sizes of the two sexes; they vary a great deal according to age, but equally large and small birds of both sexes appear to occur. The following is a résumé of my measurements:—

“Length 7·75 to 9·0, expanse 13·25 to 14·80, wing 4·1 to 4·67, tail from vent 1·87 to 2·5, tarsus ·89 to ·95, bill from gape 1·5 to 1·7, at front 1·57 to 1·74, weight 1·53 to 2·48 ozs.”

Stoney records the weight of Jack Snipe shot in Madura as 1½ to 2 oz.

Distribution.—A synopsis of the distribution of the Jack Snipe is given by Oates in the second volume of his ‘Game-birds.’ He writes:—

"The Jack Snipe is found over the whole peninsula of India from the Himalayas to the extreme south, and also in Ceylon. It has not yet been obtained in the Andamans and Nicobars, and probably does not occur in these islands. To the east it ranges from Assam to Pegu, and to the latitude of Moulmein, but I cannot discover that it has ever been shot in the Shan States.

"This snipe, in summer, is found in Northern Europe and Asia, up to and within the Arctic Circle, from the Atlantic to the Pacific Oceans. In winter it migrates to the British Isles, Central and Southern Europe, Northern Africa, Palestine, Persia, India, Burmah and China."

To this we must now add a few other places. Osmaston records it as having been shot by Captain Turner in 1896 at Port Blair in the Andamans. I have received specimens from the Shan States, and others again from the Federated Malay States. Specimens have also been received by the British Museum from Taiwan (Formosa), Yokohama and Hakodadi.

It also occurs fairly regularly in Ceylon, where, Wait says: "It is an occasional visitor to the extreme north of the island."

As Hume says, its distribution in the non-breeding season is very perplexing, and the thirty years which have passed since he wrote this have added very little to our knowledge as to its winter haunts. It breeds, as has already been said, practically right across Northern Asia and Europe, but whilst in winter it is recorded as comparatively common all through Northern Africa and through Asia as far east as Bengal, eastward of this it becomes rare in Burmah, and almost unknown in China. It may be that its alleged extreme rarity in China is partly due to the fact that sportsmen are not scattered throughout the whole length and breadth of that country as they are in India, and so we have not the same number of sporting records. This is not, however, a satisfactory explanation, as there are several European settlements, all with their quota of sportsmen and field naturalists, who would almost certainly have come across and shot Jack Snipe had they been there to shoot. Again, paucity of sportsmen and naturalists is no reason for the few records of Jack Snipe obtained from Burmah, and there can be no doubt that east of the Bay of Bengal the Jack Snipe at once becomes very much more uncommon than it is to the immediate west of it. The only record

I can find which shows this bird to be anything but rare east of Bengal is made by Oates in his 'Game-birds,' p. 479, where he remarks :—

“ In upper Burmah, where the Jack is fairly common, six may occasionally be bagged in one day.”

Hume suggested that all our birds were possibly western migrants; but, as he himself added, this is hardly possible, as the birds arrive in Eastern India earlier than they do in the west. It seems probable, therefore, that the migration of the Jack Snipe when leaving their breeding haunts is western and south-western, and on the return journey eastern and north-eastern. We have already shown that the trend of migration of the Pintail Snipe on its southern migration and on entering its winter resorts is decidedly western, and it would appear that the Jack in Asia carries this western trend to an extreme.

Within Indian limits the distribution of the Jack Snipe is very irregular, and it is not nearly as common as either the Pintail

Fantail, though on rare occasions it may be come across in considerable numbers. It is to be found more or less all over the Indian continent at different times during the cold season, but there are few places in which one can rely on obtaining more than an odd bird or two with any certainty.

Tickell says :—

“ On one or two occasions, in very jungly places of bog and rank weeds interspersed among rice cultivation, I have found the “Jacks” almost monopolising the ground, to the exclusion of the Common Snipe, but this is very rare; I think I have met with more to the southward, on the borders of Orissa, than in any part of Central India, on either side of the Ganges. In the Calcutta market, where the Common Snipe is to be seen in heaps, dead and alive, the Jacks are seldom to be met with. They seem to me to take to the more retired parts of the country, such as Singhbhum, where, especially in the *ghat purrum* (beyond the Ghats) the rice cultivation struggles for mastery with the swampy jungle.”

In regard to this note Hume remarks :—

“ He is quite wrong, however, about the Calcutta market, to which thousands are yearly brought.”

It is, however, very doubtful whether Tickell was really wrong

in his estimate; as Finn says when discussing the same point, there is no doubt that the numbers do fluctuate considerably year by year, but he watched the Calcutta markets very carefully for nine years, and in the years 1882, 1883 and 1884, I did the same, and never did either of us see the Jack Snipe exposed for sale in any quantities. Certainly in no year did the Jack Snipe number on an average one in 100 of the various snipe thus exposed.

No very careful record was kept in Hume's day as to the comparative numbers of the various species obtained, and all estimates made were very rough, and in many cases possibly not quite reliable. Fortunately we are now in a position to give actual figures showing the proportion of Jack Snipe to other snipe shot in many parts of India, sufficient to allow us to give a very close general estimate of their numbers as compared with the Fantail and Pintail.

The most carefully compiled table I have received up to the present is one sent me by Mr. R. F. Stoney, of the P.W.D., who has been good enough to let me have a complete account showing the snipe shot by him during the last ten years, 1901-2 to 1910, in the districts of Chingleput, Nellore, Madura, Bezwada, Villapuram, Ellore and Tanjore. From this most interesting table we find that out of 7,131 snipe shot, only sixty were Jack, and that these were distributed fairly equally throughout the various districts of the Province. Shooting in Cannanore, Major F. Wall, I.M.S., was even less fortunate in coming across this little snipe, for, out of 427 snipe shot, he records that there was only one Jack.

Again, Mr. H. Saunders, sending me notes on the comparative numbers of the different species of snipe shot by him, says that he got no Jack in Ceylon, and that in Bangalore out of 274½ couple of snipe only four couple were Jack, but that, shooting round about Lucknow, Jack Snipe actually numbered no less than 40½ couple in a total bag of 74½ couple of snipe. It seems, therefore, that although Tickell records them as being more plentiful in Orissa than elsewhere, the same does not obtain further south.

From the Deccan also we have regular statistics compiled by Mr. W. Gaye, and given in the B.N.H.S. Journal, for the years 1888-90. There the total number of Snipe bagged is given as 621, of which only twenty-eight were Jack.

In Bengal, in the cold weather of 1883-84, I kept an account of 2,000 snipe shot, and amongst these there were no more than nineteen Jack, of which eight were bagged in one day. In Behar, Inglis and others report them as "rather scarce" and "rare."

In Upper Burmah, as we have seen, Oates reports them as comparatively common, but Mr. K. C. Macdonald in writing on the birds of Myingyan records that Mr. Prideaux shot only three birds during the season 1898-99, and that he himself shot one Jack out of 461 snipe shot by him in 1899-1900.

Harington also records that one or two are shot every year on the Upper Chindwin, and Mr. J. Whitehead in some notes to Major Harington records shooting seven birds in one year out of a total bag of 303 snipe shot near Rangoon, but he says that on the whole he has found them very uncommon in Burmah.

In Cachar and Sylhet, as elsewhere, the numbers varied considerably in different seasons. One year Captain (now Colonel) Melville and myself shot ninety-four couple of snipe in three days in a bheel near the station of Silchar and got fifteen couple of Jack amongst them; and that season we must have shot forty couple of Jack at least. One day I got eight to my own gun. Most years, however, saw only ten to a dozen killed during the whole cold season, and sometimes the number fell to two or three.

In the Brahmapootra Valley I found them very rare, and I do not remember even seeing more than a couple in one day.

The above statistics suffice to show, I think, that the Jack Snipe when compared with the Pintail and Fantail in India, is a very much less common bird; though in particularly attractive spots it may occasionally be met with in some numbers. It is also possibly more common west and north of Allahabad than it is to the south and east, and gets rare again in the further north and north-west; but our records from the extreme north-west are very meagre.

Nidification.—The Jack Snipe breeds from the Atlantic to the Pacific throughout Europe and Asia in the far north; and is, perhaps, most common during the breeding season in Finland, where its nests were first taken by Wolley. Buturlin found it numerous on the Kolyma Delta in 1905. It is reported to breed in considerable numbers throughout Russia, north of the latitude of St. Petersburg;

and extends throughout Northern Europe to Great Britain, in which country it is said to have bred or been shot in the breeding season, as far south as Yorkshire.

During the breeding season the Jack Snipe makes a curious sound whilst on the wing; but it is very doubtful whether this sound is "drumming" in the true sense of the word, and the best observers still consider the sound a vocal one.

Dr. Bahr thus writes about *Gallinago gallinula* :—

"The Jack Snipe has twelve tail feathers, of which the outer three are markedly shorter than the three central ones. Their texture is soft and the rami are easily separated, in contradistinction to those of the species we have already considered. On experiment, these feathers produced no sound at all.

"The structure of the outer web of the outer feathers more nearly approaches that of the inner—a marked difference to that found in the other feathers we have been considering; that is, the rami of the outer web are provided with distal and proximal rows of radii, and thus adhere together. The distal radii are provided with four hamuli both in the outer and inner webs."

Buturlin, writing to Dr. P. H. Bahr on the "drumming" of the Jack Snipe, says :—

"I heard it every day in the summer of 1905 when on the Kolyma. The bird usually flies so high that even with the aid of the midnight sun and good Zeiss binocular it is often quite invisible; nevertheless, the sound 'top-toppy, top-toppy' is quite clearly heard."

Wolley's description of the breeding of this little Snipe still remains the best and the most interesting and is therefore quoted *in extenso*. He writes :—

"I scarcely like to tell you about the Jack Snipe; anything I can say must be so poor an expression of my real exultation at the finding of this long-wished-for egg. It was on the 17th of June, 1853, in the great marsh at Muonioniska that I first heard the Jack Snipe, though at the time I could not at all guess what it was. An extraordinary sound unlike anything I had heard before. I could not tell from what direction it came, and it filled me with a curious surprise. My Finnish interpreter (Theodore) thought it was a Capercally, and at that time I could not contradict him; but soon I found that it was a small bird gliding at a wild pace at great height over the marsh. I know not how better to describe the noise than by likening it to the cantering of a horse in the distance over a hard

hollow road: it came in fours, with a similar cadence and a like clear yet hollow sound. The same day we found a nest which seemed to be of a kind unknown to me. The next morning I went to Kharto Uoma with a good strength of beaters. I kept them as well as I could in line, myself in the middle, my Swedish travelling companion (Herr Salomon) on one side and the Finn talker on the other. Whenever a bird was put off its nest the man who saw it was to pass on the word, and the whole line was to stand whilst I went to examine the eggs, and take them at once, or observe the bearings of the spot for another visit, as might be necessary. We had not been many hours in the marsh when I saw a bird get up before Herr Salomon, and I marked it down. In the meantime the nest was found, and when I came up the owner was declared to have appeared striped on the back and not white over the tail. A sight of the eggs as they lay raised my expectations to the highest pitch. I went to the spot where I had marked the bird, put it up again, found that it was indeed a Jack Snipe, and again saw it after a short, low flight drop suddenly into cover; once more it rose a few feet from where it had settled, I fired, and in a minute had in my hand a true Jack Snipe, the undoubted parent of the nest of eggs. I walked as composedly as possible back to my friend; he said: 'A common bird, I suppose?' I replied: 'Yes, very;' but I shook him warmly by the hand and told him that common birds sometimes lay very rare eggs. As usual, I took measures to let the whole party share in my gratification before I again gave the word to advance. In the course of the day and night I found three more nests, and examined the birds of each. One allowed me to touch it with my hand before it rose, and another got up when my foot was within six inches of it. It was very fortunate that I was thus able satisfactorily to identify so fine a series of eggs, for they differ considerably from one another. I was never afterwards able to see a nest myself, though I beat through numbers of swamps. Several with eggs, mostly hard set upon, were found by people cutting hay in boggy places in July. I have spent a good many hours this present year (1854) in the same Kharto Uoma without finding one, though I had plenty of men and boys in good working order. There have been certainly few Jack Snipes in the country this season. The nest of the 17th and the four of the 18th of June were all alike in structure, made loosely of little pieces of grass and *equisetum* not at all woven together, with a few leaves of the dwarf birch, placed in a dry sedgy or grassy spot close to more open swamp. I found them generally at the best time for finding birds by walking them up from their nests, that is in rainy weather or about midnight. The gnats are, however, there so terribly voracious—destructive—no word is too strong—that tar oil, templar caps, veils and thick leather gloves are indispensable.

"It was not long after I first heard it that I ascertained that the remarkable hammering sound in the air was made by the Jack Snipe; but I have not yet quite satisfied myself whether the *keet-koot* on the ground, and the *baa-aa-aa* in the air, which are constantly to be heard in the same place, are made by one and the same bird at different times. At a considerable height it is not easy to distinguish a Jack Snipe from another Snipe, and the clicking and bleating seem to my ears exactly like the Common Snipe. However, I did not find a single one of the latter bird in Iso or Kharto Uoma, though I have met with one or two elsewhere in the neighbourhood. Few of the country people recognise two kinds; they consider that all the sounds proceed from the same bird, the 'Ram of the Heavens'; they take them for signs of the weather, or they adapt them to words pretending to be the lamentations of transmigrated girls, who have died in their maidenhood, and are bewailing their hard fate; but the lads generally get the worst of it in a trial of wit with their fair companions."

("The above written by Mr. Wolley from Muoniovara, 27th November, 1854, to Mr. Hewitson, was by him printed, with a few omissions—now restored—in the third edition of his work.")

"Mr. Wolley," adds Professor Newton, "subsequently satisfied himself that the Jack Snipe did not bleat in the air or utter the *keet-koot* call-note on the ground, those noises being exclusively due to the Common species; but both are called indifferently the *Jeivaar Jaure*, meaning the 'Ram' or, I believe, more strictly, the 'Wether of the Heavens.'"

The Jack Snipe commences breeding a good deal later than the Fantail, and appears seldom to lay before the end of May, though I have a clutch of eggs taken in Finland on the 21st of that month. The majority of birds do not lay until the second or even third week of June, and eggs may be found (*vide* Wolley above quoted) until well on into July. Naturally the further north the breeding ground, the later the Jack Snipe lays, and in the most southern portion of its breeding area, late eggs of *Gallinago gallinago* may be taken on the same ground and at the same time as the earliest eggs of *Gallinago gallinula*.

The nest consists merely of a few blades of grass, weeds or leaves in some natural depression in the ground, but in a few instances they are said to collect together a considerable amount of material, more especially when the site selected is a wet one. As a rule, the nest is placed in some wide-stretching fen on a small tussock or patch of

ground slightly higher than the surrounding fenland, and several pairs of birds may be found breeding on the same swamp. Sometimes, however, the Jack Snipe lays its eggs at a considerable distance from any actual swamp, and they have been found in hay-fields or in strips of grass land which contain soft and muddy patches.

The full complement of eggs laid is always four, as with other snipes, and the eggs themselves are typical snipes' eggs in shape, colouration and texture, but are extraordinarily large in proportion to the size of the bird. A hen Jack Snipe, after laying her last egg, seldom weighs more than 2 ozs., yet the weight of the four eggs is, roughly speaking, about $1\frac{1}{2}$ oz.

As regards the few eggs in my collection and those in the British Museum collection and elsewhere, I can see no difference in colouration between the eggs of *Gallinago gallinago* and those of *Gallinago gallinula*, but it has often been claimed for the latter that they are more richly coloured on an average, and this may be the case when a large series is taken into consideration. The ground colour is generally a yellowish stone-colour, often tinged with green or grey, or, less often, with reddish, and the markings consist of broad blotches and spots of deep-brown, many almost black, with others underlying them of dark purplish-grey. Occasionally these secondary markings are paler and more washed-out in character, and are then rather a lavender than purple-grey. The markings, both primary and secondary, are generally more numerous at the larger end, being sometimes almost entirely confined to this. In one pair in my collection, which comes from Finland, the blotches form a broad ring about the larger third of the egg, the markings on the smaller two-thirds and inside the ring being but few in number and very small. The texture is smooth and close, and usually there is a decided gloss; the shape is the ordinary pyriform or peg-top.

Oates gives the measurements of the Jack Snipe's eggs as varying between 1.4 and 1.65 inches in length, and between 1.05 and 1.13 in breadth. Dresser gives the average as 1.55×1.05 inches, and those in my collection average 1.52×1.09 .

I fear that in Western Europe the Jack Snipe is becoming rarer, and it is now difficult to obtain nests where twenty years ago the breeding bird was almost common.

General Habits.—As to the time of arrival of the Jack Snipe in India, and the average date of its departure therefrom, we have not yet sufficient data on which to declare anything very definite. The *probability* is that it arrives much the same time as does the Fantail, and also departs with that bird, possibly arriving a little later and never staying on quite so late as the latest Fantails and Pintails do. Mr. Stoney's records are the only ones we have upon which one can work out a theory of any value. During the ten years these records cover he notes the earliest Pintail as being shot on the 27th August, and the average date of the first bird as about the middle of October. The Fantails also arrived in early October, but no Jack Snipe were shot until the 3rd of November. Whereas, also, his last Pintails and Fantails were shot in April, the last Jack was killed on the 10th March.

The Jack Snipe is a very particular bird in his choice of an abode, and when shooting over a large tract of country the sportsman will find that but few spots are affected by the Jack, but that these few places are resorted to again and again, by the same bird if it is missed when first put up, or by another if the original occupant is killed. Hume's description of this little Snipe's favourite haunts cannot be improved upon, and I again indent on that much-quoted author. He writes:—

“Now, these pet abodes have a character of their own; they may always be correctly described as *corners*; sometimes they are corners of paddy fields, surrounded on two out of three sides by a low earthen embankment: sometimes they are in an angle formed by a little scrub, or a couple of bushes, often just at the corner of a bed of bulrushes or high reed; they are always in sheltered secluded spots, where the ground is thoroughly moist or marshy, and where the cover is pretty high.”

This curious affection for “corners” exhibited by the Jack Snipe struck me very forcibly when shooting in Cachar. Our shooting ground was a vast expanse of rice cultivation interspersed here and there with higher land, here and there with deeper pools or stretches of swamp, but for the most part dead level rice-land stretching field after field in every direction. In places, however, small patches of land had been left uncultivated, and in these patches, generally extra swampy and muddy, grew a dense, bushy grass mixed with

weeds, always thicker and higher near the banks which divided the uncultivated patch from its neighbours. It was in these places that we found the Jack Snipe, and we noticed also that they rose almost invariably from the corners where the vegetation was most rank. Shooting over this ground in the morning we put up Jack, sometimes two or three, out of each of these scraps of grass which we worked through, sometimes killing, sometimes missing. Returning again in the afternoon over the same ground, the same thing occurred, and that whether we had missed or killed in the morning. We shot over these fields on three consecutive days, and each day we must have put up from fifteen to twenty Jack Snipe, killing about ten of them. As far as I remember on no single occasion did we put up a Jack from the ordinary cultivated rice-land, though we bagged one or two from corners of the swamps and in cosy little jungly corners running up into the higher land.

As a rule the Jack sits very close and requires a good deal of persuasion to make it rise. Nor does it run after alighting as the Common Snipe so often does, and if after being flushed it again settles, it will, if looked up at once, be found at the exact spot where it has dropped. It is said to have an extremely strong smell, so that shooting with dogs, as at home, Jack are not often passed over, but out here, where dogs are, and can be, but seldom used, many Jack must be passed over as they lie snug in their cover.

Jack rise silently and very vertically, and once up and away, their flight is exactly like that of a butterfly. It's flight may be slower than that of either the Pintail or Fantail, but it is a very disconcerting bird to fire at after one has been shooting for some time at the bigger birds. Hume says that it is probably one of the easiest birds in the world to shoot if you reserve your fire to the proper moment, but I must personally confess that I have never yet quite made up my mind as to which this proper moment is. The bird's whole flight is so erratic that one can never tell what its next movement is going to be; it rises, drops, dodges to one side or another irrespective of all ordinary rules of flight, and then when you think it has settled down to a flight in one direction, it falls to the earth as if already shot, and you then walk it up to have the same performance repeated.

Directions as to how to shoot the Jack Snipe are plentiful, and two may be quoted. Booth says :—

“ A Jack Snipe . . . was almost invariably missed through firing too quickly, and . . . I was forced to repeat aloud one, two, three, four, five, six before bringing my gun to the shoulder . . . now . . . ill-luck invariably attends the bird that is patiently waited for.”

Colonel Hawker, however, gives the following advice :—

“ Nothing teases a poking shot worse than a Jack Snipe, but to one who has the knack of pitching and firing his gun in one motion, they are generally speaking not much worse to shoot than other small birds.”

Its curious flight seems also to be too much even for the powerful winged birds of prey, for Finn records that Mr. Jesse “ recently saw one pursued by quite an assortment of raptorial birds, and yet evade the whole villainous combination, which included a pair of lugger falcons, two kites, a tawny eagle and two ruffians unidentified.”

It is, however, a gamey little bird well worth expending one or more shots on, as there is no daintier morsel of food obtainable than a Jack Snipe, generally a little ball of fat and in flavour excelling any of his larger relatives.

The Jack Snipe has been accused of being unable to swim, but this is quite incorrect, for I have seen a winged Jack fall into a clear pool in a swamp, right itself at once and swim straight to the edge, where it promptly concealed itself in the weeds.

Genus **ROSTRATULA**.

The genus *Rostratula* is perhaps more nearly allied to certain of the sandpipers than to the true snipes, and is certainly nearer the former in anatomy. The bill is long, as in the snipes, but is curved gently downwards, and is swollen at the tip, and the upper mandible does not overlap the lower as in *Gallinago*. The retractile muscles are also absent, so that in the dry bill no pits show, though both mandibles are grooved. The eyes, though very large and snipe-like, are placed well forward; the legs are rather long and very sturdy, the toes long, and the tibia naked for some distance above the joint.

The general plumage is more lax than in the snipes, and the wings are broad, but rather short. The tail contains fourteen feathers. The sexes are quite different in plumage, whilst the windpipe of the female Painter is longer than that of the male, and curves into one full loop.

The genus contains three species, our Indian bird, which also extends to Africa, and two others which inhabit Australia and South America respectively.

The sportsman can confound the Painted Snipe with no other bird; for, as soon as it is in his hand, he sees that it is a snipe or snippet of some kind with wonderfully painted plumage; and there is no other species of the *Charadriidæ* which can compare with it in colouration, though some of the sandpipers in their rufous breeding plumage are very handsome.



THE PAINTED SNIPE

male.

Rostratula capensis

3 life size

female

ROSTRATULA CAPENSIS.

THE PAINTED SNIPE.

Scolopax capensis, Linn, *S. N.* i, p. 246 (1766).

Rostratula capensis, Vieill, *Nouv. Dic. d'Hist. Nat.* vii, p. 1; Sharpe, *Cat. B. M.* xxiv, p. 683; *id.* *Hand-L.* i, p. 167; Oates, *Game-B.* ii, p. 489; Finn, *In. Waders*, p. 155; *Blanford Avifauna*, *B. I.* iii, p. 293; *Stuart Baker*, *J. B. N. H. S.* xii, p. 501; *Bourdillon*, *ibid.* xvi, p. 10; *Macdonald*, *ibid.* xvii, p. 500; Oates, *Cat. Eggs B. M.* ii, p. 68; *Moss King*, *J. B. N. H. S.* xxi, p. 102; *Pitman*, *ibid.* p. 666; *Williamson*, *Jour. N. H. Siam*, i, p. 48; *Barton*, *ibid.* p. 109; *Herbert*, *ibid.* p. 54 (1914); *Gyldenstolpe*, *Swedish Ex. to Siam*, p. 147 (1916); *Wait*, *Spolia Zeylanica*, x, p. 237.

Rhynchœa capensis, *Butler*, *S. F.* ix, p. 428; *Legge*, *B. of Cey.* p. 800; *Reid*, *S. F.* ix, p. 69; *Hawkins*, *ibid.* p. 172; *Davidson*, *ibid.* p. 320; Oates, *B. of B. B.* ii, p. 386; *Hume*, *S. F.* xi, p. 322; *Seebohm*, *Charadriidæ*, p. 456; Oates, *Hume's Nests and Eggs*, iii, p. 350; *Munn*, *Ibis*, p. 894, p. 73.

Rhynchœa bengalensis, *Gray*, *Cat. B. Nepal Pres.* *Hodg.* p. 140; *Blyth*, *Cat.* p. 273; *Jerdon*, *B. of In.* iii, p. 677; *Stoliczka*, *J. A. S. B.* xxxvii, p. 20; *King*, *ibid.* p. 217; *Hutton*, *ibid.* xvi, p. 790; *Hume*, *Nests and Eggs*, p. 586; *id.* *S. F.* i, p. 235; *Adam*, *ibid.* p. 396; *Ball*, *ibid.* ii, p. 431; Oates, *ibid.* iii, p. 346; *Blyth & Walden*, *B. of B.* p. 157; *Butler*, *S. F.* iv, p. 15; *Fairbank*, *ibid.* p. 263; *Hume*, *ibid.* v, p. 46; *Butler*, *ibid.* p. 223; *Hume & Davis*, *ibid.* vi, p. 459; *David & Wen*, *ibid.* vii, p. 89; *Ball*, *ibid.* p. 228; *Cripps*, *ibid.* p. 302; *Godwin-Aus.* *J. A. S. B.* xlvii, Part 2, p. 21; *Butler*, *Cat. B. of S.* p. 61; *id.* *S. F.* vii, p. 187; *Ball & Hume*, *ibid.* p. 228; *Cripps*, *ibid.* p. 302; *Hume*, *ibid.* p. 484; *id.* *Cat. No.* 873; *Hume*, *S. F.* viii, p. 112, p. 957; *Doig*, *ibid.* p. 371; *Butler*, *Cat. B. S. Bom. Pres.* p. 76; *Hume & Marsh.* *Game-B.* iii, p. 381; *Vidal*, *S. F.* ix, p. 84; *Bingham*, *ibid.* p. 197; *Davidson*, *ibid.* p. 230; *Dawson*, *ibid.* x, p. 414; *Murray*, *Vert. Fauna Scind.* p. 242; *Barnes*, *B. of Bom.* p. 347; *id.* *J. B. N. H. S.* i, p. 59, et vi, p. 130.

Vernacular Names.—*Ohari*, Nepal; *Kone*, *Konebatta*, Singbhoom; *Tibud*, *Pan-Lawa* (Mahrati), *Ratnagiri*; *Mail-ulan* (Tamil), Madras; *Baggarjee* (L. Bengal); *Rajachaha* (Saugur); *Rajakaeswatuwa* (Cing.); *Daodidap Gajao* (Cachari).

Description. **Adult Male.**—Crown olive-black, with very fine bars of white and a broad median band buff; feathers round the eye,

short, but broad, streak behind it over the ear-coverts buff, the feathers next the buff darker than elsewhere on the head; lores grey-brown, very finely barred with black and more or less stippled with white. Upper back and scapulars a more olive-brown with patches of dark metallic olive-green, and the outer webs of the scapulars buff, forming two lines down the sides of the back similar to those in true snipes; lower back, rump and upper tail-coverts a vinous-grey, very narrowly barred with black, and with a few white dots, the last-named also with buff circular spots; tail the same with buff edges to the tips. Wing-coverts and inner secondaries metallic olive-brown, finely barred with black and buff and with broad buff bars and spots on the outer part of the wing; quills blue- or vinous-grey, finely barred with black, the outer primaries with broad alternate bands of black and buff on the outer webs, the inner primaries and secondaries with broad buff marks only, which become oval spots on the inner secondaries. Chin and neck mottled brown and white; breast and flanks brown, the latter mottled with white and the breast edged with dark brown next the abdomen, which, with the under tail-coverts, is white; a buff or white band passes up from the breast to form a shoulder girdle which connects with the buff scapulary lines, the borders to this band are black or darker brown than the adjoining parts. Under wing-coverts vermiculated grey, black and white; axillaries pure white, and there is a broad white band formed by the tips of the median under wing-coverts.

Colours of Soft Parts.—"The legs and feet are generally greenish, usually a pale yellowish-green, or greenish-yellow, often greyer and dusker, or somewhat hoary on the joints and toes; sometimes, however, they are a deep olive, sometimes pale bluish overlaid with a greenish tinge, and sometimes simply dull pale green; the claws are brown, sometimes paler, sometimes darker.

"The irides vary from hazel to very deep brown, and have sometimes a greenish or olive tinge.

"The bill is very variable; typically it is a pale fleshy-brown, darker or purer brown towards the tip, and with a greenish tinge towards the base; it is subject, however, to a good deal of variation." (*Hume.*)

The above description of the soft parts as given by Hume refers to both male and female.

Measurements.—"Length 9.25 to 10.0 inches, wing 4.9 to 5.2, tail from vent 1.5 to 1.8, tarsus 1.65 to 1.83, bill *at front* 1.65 to 1.85. Weight 3.5 to 4.9 oz." (*Hume.*)

Adult Female.—The circle round the eye and the band behind it are pure white. The chin, throat, neck and extreme upper breast a rich chestnut, with a broad pectoral band of blackish-brown running up as far as the scapulars and succeeded by a pure white band, which is again followed by another brown band, interrupted in the centre with white. The scapulars and back have not the buff markings of the male; but the underlying scapulars are pure white, forming a tuft of white feathers which show up through the others. The wing-coverts and inner secondaries are a rather bright olive-green, closely barred with black and more or less tinged reddish. The general aspect of the closed wing is thus green in the female, whilst it is a game-bird vermiculated-brown in the male. The remainder of the plumage is like that of the male.

Colours of Soft Parts.—"Bill greenish-yellow, fleshy at the tip of both mandibles; feet pale green; iris dark brown." (*A. E. Butler.*)

"The bill is olive-brown throughout in the cock, in the hen brown at the base shading into flesh-colour at the tip." (*Finn.*)

I have not personally been able to discriminate between the sexes as regards the colouration of the soft parts, and think the variations are individual and not sexual.

Measurements.—"Length 9.75 to 10.89 inches, wing 5.25 to 5.6, tail from vent 1.65 to 2.0, tarsus 1.75 to 1.96, bill *at front* 1.8 to 2.05. Weight 4.4 to 6.42 oz." (*Hume.*)

"The young birds of both sexes resemble the male in plumage, *but the female may be known at all stages by the presence of some white scapular feathers.* Females in every phase of plumage between that of the male and that of the adult female are very common in collections." (*Oates.*)

Young Male.—Resembles the old male almost exactly, but has the throat entirely white, the lower throat and foreneck washed with brown, with some dusky streaks." (*Sharpe.*)

Young females which have just acquired adult plumage have the

chestnut of the head and neck very dull, and the feathers are margined with dusky.

Nestling.—Dull grey or buff-grey, with a broad coronal streak and eye streak of rich brown. The centre of the back is rich rufous with a band of black on either side, and there are also lateral bands of purplish-brown, running from under the wings as far back as the thighs. The wings are banded buff and brown.

There is no seasonal change of plumage in the female.

Distribution.—Africa, south of the Sahara, but extending east to Egypt, Madagascar; throughout Southern Asia, though it appears to be very rare, if existing at all, in Arabia and Persia; in all parts of India, Ceylon, Burmah and in the Malayan Peninsula, throughout Southern and Central China to Japan, and also in Sumatra, Java, Borneo, the Philippines and Formosa.

In India it is to be found in practically every part of the Continent where there is suitable country for it, and, in the same way, it is to be found at a considerable elevation in the Himalayas and other mountain ranges where there are swamps, lakes, etc., for it to live in. In Kashmir it is often met with as late as September, but seems to migrate to lower elevations in the winter. In the Khasia Hills it is found up to 5,000 feet in summer and up to nearly 2,000 feet in winter. I have also records of its ascending the Nilghiris to about the same height, and in Travancore it seems to be found up to 3,000 feet, as I have had eggs sent me for identification taken at that elevation.

Nidification.—There is, I think, little doubt, but that, like the Bustard-Quails, the female Painted Snipe is polyandrous, and that like the Bustard-Quails also, it falls to the lot of her many husbands to hatch and rear the young. There are many points about the bird's habits which have led me to this belief. Reference is made further on to the parties or flocks, of these birds which certain observers have recorded as having seen. Now in every case in which such records have been made (Butler, who recorded female flocks, afterwards corrected his statement) the person recording it has stated that these parties consisted entirely of males, that is to say, of birds in the male plumage. Hume says that the larger of such flocks as he has seen have appeared to him to consist of two or more families of parents

and young, but again it will be noticed that he makes no mention of any birds in the female garb, and indeed implies by the context, that they were all in the male plumage. It appears, therefore, that these parties consist of one or more adult cocks with their young, and the only inference we can draw from this is that the cocks are left to look after the nestlings and bring them up.

As regards the hatching of the eggs, all I can say at present is that every bird that I have shot off the nest, or have had sent me as being trapped or shot off the nest, has been a male. Hume writes on this point: "In no less than three cases in which old birds have to my knowledge been captured on the eggs, such old birds have proved to be males."

Against this theory is Captain E. A. Butler's experience, which appears to be that both birds take part in incubation. He says, in describing the nidification, that "the old birds are almost always near the nest," and all through this note he uses the plural number for the parents, although he does not definitely say that he has ever shot a female off the nest, though in one paragraph he speaks of the bird as a female. The conclusion I have arrived at that the male alone carries out the duties of incubation has been further corroborated by other observers and sportsmen, some of whom did not even know that the more gaudy bird of the two was the female, and had, until they were told this, stoutly asserted that the female always sat on the nest and the male never. The fact that the female of the two sexes is provided with the powerful voice apparatus, and does the calling, to which it must be presumed the male replies in person, certainly looks as if she were the dominant factor in their matrimonial arrangements.

Yet again we find that the breeding season of the Painted Snipe extends practically the whole year round, ceasing in different localities only when the state of the country renders the food supply precarious, and when the scanty meals and constant work necessitated to obtain even these suffice to quell for the time being all desires to nest. Now this continuous laying of eggs by the female would prove far too great a strain on any bird's constitution if the time between the laying of each clutch of eggs were taken up in hatching them and rearing the young, but, given this time in which

to recuperate, each female might well lay four or even more clutches in the year. Doubtless, too, sportsmen have noticed that they kill two or three adult males to every adult female, and this fact, that the males should be far more numerous than the females, is what is to be expected in a polyandrous species.

There is also some proof that the females fight for the possession of the males, for the Cachar Mahomedan Shikaries, who reverse the sexes, all say that the males are great fighters and constantly fight over the females.

Captain C. R. S. Pitman sends a very interesting note to the B.N.H.S. Journal which goes far to confirm my theory.

"I then put two off their nests, which proved to be males. Each nest contained four eggs, and incubation had started. In this place I counted sixteen and shot nine; five of these were males and four females; there were, however, no more females, as the difference in the sexes is very noticeable when on the wing.

"In December, 1910, I noticed some Painted Snipe near a small tank, and always saw three; they proved to be two old males and one female."

The breeding season of the Painted Snipe begins on the 1st of January and ends on the 31st December, being shortened, as already mentioned, merely by local limitations, such as failure of water supply, and consequently of suitable habitation and, to a less extent, of sufficient food. In places where there are swamps well supplied with water and cover all the year round we shall find that eggs of the Painted Snipe may be found during any month of the twelve, being naturally most numerous during those months in which the food supply is most plentiful and the birds are consequently in the best condition.

Legge says that in Ceylon—the evergreen—this bird breeds throughout the year, and he mentions having records of eggs or young in every month of the year except January, February, August and October. As, however, he got an oviduct egg on the 31st December and young birds in March, his records practically cover the whole year.

In Cachar and Sylhet it is the same, though but few birds breed in March and April, when water is comparatively scarce; in the Sunderbunds they breed all the year round, but seldom in August and September, when their favourite breeding grounds are flooded.

In Siam, Herbert found eggs in July and August and full-fledged young in September and October, whilst he only obtained a chick in down at the end of the former month.

Almost any site near water will do for a Painted Snipe's nest. It may be a tiny isolated pool with a few sedges and a sheltering bush, or it may be some equally tiny islet just above flood level and placed in the middle of a sea of water and jungle stretching for miles on every side. I have taken them from dense tangles of cane and jungle, growing on the borders of the morasses which stretch, in their lonely wildness, for miles along the foot of the Himalayas, far from all signs of civilization; and I have taken a nest from a ditch actually in the station of Silchar, and within thirty yards of a house. Nor is it necessary that the nest should be placed in uncultivated swamp-land, for in parts of India it is often found (*vide* Butler) in or near rice-fields. He writes:—

“The nests, all of which were in the vicinity of rice-fields, were, in most instances, on the ground; but in one or two cases they were raised as high as eight or ten inches from the ground, and supported by the grass in which they were built.

“Of the various situations they were found in, I may mention as one of the most common the raised footpaths which so often intersect these rice-fields. In the rains the sides of the path become overgrown with grass, and in this grass the nest is often built. Another favourite place is the short, dark-green rushy grass that grows by the side of tanks and in swampy ground—this, perhaps, is the most favourite place of all; and in many of the nests found in this situation the blades of grass were drawn together over the top of the nest, so as to form a sort of canopy as in some nests of *Porzana akool*. Another favourite spot is a rice-field which has been ploughed up and left unplanted for some time until the grass begins to grow over it.”

The bird does not always wait, however, even until the grass has begun to grow, for during three seasons Mr. H. A. Hole found nests placed in fields which had been so recently ploughed that there was practically no growth on them, and the nest had been placed merely under the shelter of a clod of earth larger than the average. Two or three such nests were shown to me by him, and others I myself found when staying with him. Some nests, the majority perhaps, were placed in the jungle which covered the sides of the ditches, but

a very large number were taken from the bare fields well away from the sides. A very curious fact we noticed here was that we repeatedly came across single eggs dropped casually by the hen bird on the ground with no sign of a nest, and, apparently, with no thought of their incubation.

The nest itself is a fairly compact pad of grass, straw, rushes or weeds, measuring about six inches across, and from one to three inches in depth. When placed in a deeper hollow than usual the nest may be almost cup-shaped, but as a rule is merely a flat pad which has a depression less than an inch in depth. It is nearly always placed actually on the ground, but occasionally a few inches off it in a tuft of grass thicker than usual; even more rarely, it may be found placed on a tangle in a cane-brake just above the water or mud. Nearly always a wet situation is chosen or one just close to mud and water, but this is not invariably so, and, as already narrated, I have taken nests from quite dry fields some distance from any water or wet ground. So also, though most nests are fairly well concealed by cover of some sort, others are placed conspicuously in the open or in stunted grass or stubble, in positions in which it seems impossible they should escape the unwelcome attentions of vermin, winged or otherwise.

The number of eggs laid is almost invariably four; five and six are abnormal, and three only quite exceptional.

They are very beautiful, but do not in the least strike one as being eggs of any of the Snipe tribe.

The ground colour is generally yellowish, ranging from a pale stone-yellow to a bright yellowish-*café-au-lait*; the tint is nearly always bright and the dominant colour is nearly always yellow, but the actual tint varies much, and there may be a grey, green, olive or even a pink tinge in it. The markings are always very bold in character, and generally consist principally of very large blotches, with a varying number of specks, spots and lines, of deep vandyke-brown. The centres of the larger blotches and where they overlap one another are almost black, but the outer edges are sometimes paler and more of a sienna-brown. The secondary markings are but few in number, and of the same shape as the others, but in colour are a grey-brown or sienna-brown, more or less washed-out in appearance.

In some eggs the superior markings are paler in colour than usual, and now and then one comes across a clutch in which all the markings are a light sienna-brown.

In all eggs normally marked, the markings are most numerous towards the larger end, often forming there an irregular cap, sometimes a broad, irregular zone.

I have one clutch of eggs in which the markings consist mainly of twisted lines, long and short, with but few blotches or spots. In this the ground colour is the usual yellow, but an even more abnormal clutch has the ground colour a pink, almost purplish stone-colour with the usual markings of vandyke-brown. This is a very beautiful clutch, and I have never seen another at all like it.

An exceptionally handsome clutch taken by Harington in Burmah has the markings on the eggs confined almost entirely to a deep band of black running round the centre of the egg and covering more than half its surface.

Moss King records taking a clutch with a greenish ground.

In shape the eggs show some similarity to snipes' eggs, but are, what one might call, of a modified character, the true peg-top egg being quite exceptional and ordinary ovoid or elliptical eggs quite common. Between these two extremes eggs may be found in every shape, the slightly peg-top shape being the most common.

The texture is hard and close, but not so fine as in the eggs of *Gallinago*, and though there is generally a slight gloss, and sometimes a good deal, they are on an average not nearly so glossy as the eggs of that genus, nor do they retain their fine surface and colouration for nearly so long a time.

All my eggs come within the limits of size given by Hume, 1.29 to 1.49 inches in length, and from 0.89 to 1.05 in breadth, but the 120 eggs which I have measured average 1.36×0.97 ($= 34.5 \times 24.6$ mm.) as against his 1.39×0.99 .

General Habits.—Naturally, though not migratory in the true sense of the word, the Painted Snipe, being dependent on a water supply, becomes locally migratory in those places in which the water at one season completely dries up. Thus, Adam reported that in the vicinity of the Sambhur lake, the birds were only seen during the rains, but migrated elsewhere on the approach of the hot weather

when the lakes dried up. * Reid and others note that they are more or less migratory in the Lucknow division ; and, doubtless, this local migration obtains in many of the drier portions of N.W. Provinces, Oudh and Rajputana. Hume thought that an excess water supply, such as is found in Lower Bengal, also affected their movements ; but this is probably not the case, as they have been shot, and are common, at all seasons of the year in the Sundarbans, the most watery of all parts, even of watery Bengal.

Nowhere within its habitat is the Painted Snipe ever found in such vast numbers as is the Common Snipe ; but in certain parts of the country, such as the Sundarbans of Khulna and Jessore, some thirty or forty birds may be seen in a day's trudge ; and this although the birds do not *pack* in these districts as they are said to do elsewhere. Thus in 'Stray Feathers' Butler speaks of whisps or flocks of twenty birds, and Hume in 'Game-Birds' records that he has seen flocks of a dozen or more birds together at the same time.

The Painted Snipe scarcely deserves a place amongst the game-birds ; if in anatomy he is more near the sandpipers than the snipe, in many of his habits and manners he is nearer the rails than to either the sandpipers or real snipe. Hume, with his powers of accurate observation, of course noticed this, and gives a very characteristic little anecdote to illustrate it. He writes :—

“On one occasion I saw three running about on a tiny patch of short, close, moist turf, just outside the rushes and not twenty yards from where I was, and picking up something rapidly from the ground. After watching them for several minutes, I made a slight clicking sound, and they instantly sneaked into cover with lowered heads.”

I was once staying in a house in the garden hedge of which a pair of white-breasted Water Rails had their nest. When all was quiet, the two adult birds, and later on the parents with their brood, used to come out and wander about on the lawn ; directly, however, they found out that they were being watched, simultaneously down went the eight heads of parents and children, as if suddenly filled with the deepest shame, and they all sneaked off into the shelter of the hedge. If they were disturbed by a dog they

took to their wings; and here, too, they showed how closely the Painted Snipe is like the rails. Both birds fly in exactly the same manner, though the larger wings of the Painter flap more slowly and laboriously. In starting, both rail and Painted Snipe drag their legs as if it were an effort to lift them up; and for some yards after they get under way the legs hang, and then with an effort are pulled up and tucked away in proper position under the tail.

This bird, as a rule, haunts swamps, old water-courses, and even ravines and banks of running rivers where there is ample cover. A long day's shoot in rice-fields is not likely to produce a single bird; though where there are adjacent marshes with thick vegetation, these may contain them in numbers. Even, however, in the larger stretches of water frequented by them, they seem to haunt special patches more than others, apparently preferring those which combine pools of water of some depth with plenty of soft, muddy land covered with a tangle of vegetation.

Such patches as these they are very loth to leave; they refuse to rise unless closely pressed, and soon return after the cause of their disturbance has gone. Even when shot at and missed, they may often be found again in exactly the same place within a very few hours, and this may occur several times before they are induced to quit.

A curious exception to this predilection for thick cover came under my experience in Cachar, where both Mr. H. A. Hole and I found these birds in July and August very numerous in recently-ploughed fields. Painted Snipe are very common in Cachar, and especially so in the many bheels which run along the foot of the North Cachar Hills. The ploughed fields where we found the birds were small in area, and consisted of the narrow strips of level ground which ran up into the foot-hills themselves, whilst the other ends terminated in swamp or jungle. The fields had in these months no crops yet growing on them, and though often surrounded with jungle were quite bare themselves except for the small amount of vegetation growing in the boundary ditches. Nor were these fields muddy and moist, except after heavy rain, though there was generally water in the ditches; yet the birds appeared not only to live and to feed

in the fields, but to make their nests in the ditches instead of in the swamps as would be expected.

The Painted Snipe is a strong, sturdy walker, and when, as is often the case, it inhabits cane brakes, beds of reeds or extensive jungle, it will often run great distances when it alights after being flushed. It is also an excellent swimmer, and I once saw an unwounded bird, disturbed by the near approach of a line of shooters, slip into a wide ditch of clear water and swim to the opposite side. Wounded birds have often been seen to swim either to escape capture or when shot at and dropped in open water. Legge also, quoting Layard, writes about two young Painted Snipe: "On his giving chase, the chicks took to the water and swam like ducklings."

Finn in his 'Indian Waders' has much to tell us of interest about this bird in captivity, and his remarks must be quoted at length. He writes:—

"I have kept many and found them not very lovable pets. The words used by Palgrave to describe the camel's character will describe the 'Painter' exactly, 'never tame, but not wide-awake enough to be exactly wild.' I once even reared a half-fledged young bird and got no further towards conciliating it than I did with adults. Yet these will let one pick them up with far less trouble than much tamer birds would give. In captivity can be studied with advantage the curious display by which the species seeks to terrorize an enemy. When slightly alarmed, it raises the wing furthest from the intruder; if pressed, this wing is fully expanded, while in desperation the bird faces its adversary with both wings and tail spread so that their beautiful spotted markings are fully shown. Meanwhile, a hissing or swearing note, like hot iron plunged into water, is given off. The similarity of this last attitude to that adopted by owls when on defence is very striking, and I believe the Painted Snipe is at least as nocturnal as most owls, judging from the behaviour of captive specimens. Like owls, also, this bird has a singularly expressive countenance. When in its ordinary diurnal attitude, crouched against the wall of its prison, with tail up and head down, so as to look as much as possible like a lump of mud, the head-feathers all lie flat, giving their owner a singularly stupid appearance. On the rare occasions, however, when one sees the bird walking about at ease, the feathers over the eyes are raised so as to be higher than the crown, which gives quite a wide-awake expression. In moving about thus, the head is carried high, and the bird looks tall and graceful

and moves its hind quarters up and down like some sandpipers, but much more slowly. It will search for food in water something like a spoonbill, and can swim, but this latter is not an exceptional accomplishment, being common to waders generally. The spreading of the wings undoubtedly has a terrifying effect in some instances, as I have seen a golden plover frightened by it, as also a bantam hen; but some birds—a rail, ruff and pitta, did not seem alarmed at the Snipe's demonstrations. I was told, however, of a squirrel which was seen to be scared thereby, when it came across one of these birds in one of the aviaries in the Calcutta Zoo, and I know of a case in a private aviary where a 'Painter' escaped destruction when some other birds were killed by a rat. It seems, therefore, that this gesture is a protective one. At the same time I have no doubt that the natives who told Mr. Hume that the birds showed off to each other in this way in the breeding-season were quite correct in their statements, as I have more than once noted cases in which various birds used the same gestures to express anger or fear as they display in courtship."

Herbert has an interesting note on this display of the young Painter. He writes:—

"When slightly alarmed the bird would raise the wing farthest from the intruder, but when 'cornered' both wings would be extended and brought forward until they reached beyond the tip of the beak, and the tail spread, so that the beautiful spotted markings were fully shown. The hissing, as described by Finn, was very noticeable in the older birds, but in the younger ones it was replaced by a low plaintive whistle, so that it possibly only occurs with the more fully-developed birds."

Finn, in the above quotation, says that he thinks these birds must be as nocturnal as owls, and Hume says that they certainly move about much more at night than by day. It is probable, however, that they feed freely in the early mornings and evenings, and are crepuscular rather than nocturnal in their habits. Certainly Mr. Hole and I found them constantly feeding in the ploughed fields I have referred to already, during all except the hottest hours of the day, when they retired to the ditches and were only roused with great difficulty.

They are very omnivorous in their diet, and eat both grain and animal food. An examination of the stomachs of a fairly large series of birds has given the following menus of a Painter's daily fare. On

many occasions exclusive meals of fat little field crickets, sometimes the same mixed with grass seeds or, less often, with unripe paddy; often meals of many courses including snails and tiny shell-fish, worms of all sorts and sizes, grass-hoppers, seeds, paddy and rarely millet. At other times they seem to have taken nothing but vegetarian food and once or twice I found nothing but paddy in their stomachs, mixed with the green blades of paddy leaves.

The crickets were found in the stomachs of those which had been feeding in the open fields, and it may have been the extraordinary abundance of these insects which induced the birds to forsake their ordinary habits and haunts.

I have remarked in the beginning of this article upon the difference in the length of the trachea of the male and female Painted Snipe, the latter having it long and convoluted and the former shorter and straight. This appears to correspond with a difference in voice, and we find that the female has a rather deep, mellow note, contrasting with the squeaky note of the male. Finn says he has noticed no difference in the notes of the two sexes, but says nothing further.

Wood-Mason describes the call of the female as "a low, regular, hoarse, but rich purr"; Tickell considers it "low and mellow," a single soft note frequently repeated, "kone, kone, kone"; and Hume says that to his ears it "most resembles the sound produced by blowing into the neck of a phial." Hume's description of the call seems to me to describe it well; but the reader must not imagine that the note is a whistle. A strong blow into the neck of a phial, of course, produces a whistle; but the call of the female Painter resembles the blow when it just falls short of this. It is a common enough call, and every sportsman must get to know it if he does much snipe-shooting, as the birds repeatedly call up to nine or ten a.m. in the cold weather, and again commence calling in the evening an hour before sunset.

The Plate.—The colouration is on the whole good. The feathering of this bird should be more than usually pronounced, as it is more lax and soft than in the true Snipes.

Both bills and legs are correctly coloured, but depict, of course, only one type. In most birds the legs will be found to be a less

vivid green and with a decided touch of grey or plumbeous, more especially about the joints.

The female, which is shown in an active position, should have had the feathers above the white loreal patch slightly erected.

The white scapulars give one the impression in the picture of peering out from under the tertiaries or inner secondaries ; as a rule, however, these show through between the upper scapulars and the adjoining wing-coverts.

Order GRALLÆ.

Suborder—OTIDES.

The Bustards form a suborder of birds connected with, yet distinctly separated from, many others. In general superficial appearance they are, perhaps, most like the gallinaceous birds, especially in regard to their heads and wings. They are, however, more closely allied in anatomy and other ways to many other families, such as the rails, cranes, plovers and, in the New World, the tinamus.

They are schizognathous and holorhinal, the cervical vertebræ are either sixteen or seventeen in number and the sternum has two small notches on each side of the posterior border. There is no hallux or hind-toe, and the two deep flexor tendons unite and again divide into three.

They possess ambiens, accessory femoro-caudal, semi-tendinosus and accessory semi-tendinosus muscles, but the femoro-caudal is absent.

There is no oil-gland and the cæca are long.

The contour feathers possess an after-shaft and there is no lateral bare tract on the side of the neck.

Family OTIDIDÆ.

The family of Bustards, which is the only one in the suborder Otides, contains birds ranging in size from that of a small partridge to birds weighing as much, or more than, 40 lbs. They are generally of sturdy build, with comparatively long necks and legs, the latter very strong and furnished with three toes only. These, the toes, are remarkably broad and fleshy, but at the time short in comparison to the size of the bird they have to support. The claws are short and blunt. The tarsi are reticulated with small, often unequal, scales and the toes are scutellated above.

In some species the males possess a small gular pouch, which is connected with an opening under the tongue.

The tail feathers vary from sixteen to twenty in number in different species, and the primaries number eleven, the first being of considerable length.

The young are hatched covered with down, and can run about almost immediately after leaving the egg.

Otididæ of one or more species inhabit the three continents of the old world—Europe, Asia and Africa; and one species—a very close relation of our Great Indian Bustard—is also found in Australia. Some genera and species, such as *Otis tarda*, extend over a vast extent of country; whilst others, again—for example *Sypheotis*—are very local in their distribution.

Within Indian limits we find six species, which are generally divided into four genera, but many systematists, the late Dr. R. Bowdler-Sharpe amongst others, divide two of our genera, *Otis* and *Sypheotis*, yet again; I, however, retain Blanford's classification and omit Sharpe's genera *Tetrax* and *Houbaropsis*.

Key to Genera.

A. No ruff; sexes differing in size or in breeding plumage.

a. Top of head black.

a'. Wing over 20 inches *Eupodotis*.

b'. Wing under 16 inches *Sypheotis* ♂.

b. Top of head not black.

a''. Tarsus more than one-third length of wing . . . *Sypheotis* ♀.

b''. Tarsus one-fourth length of wing *Otis*.

B. A ruff on either side of neck; sexes alike *Houbara*.

Genus OTIS.

This genus is now generally divided into two, *Otis*, confined to *Otis tarda* and its first cousin *Otis dybowskii*, and *Tetrax* which contains only the Little Bustard, *Tetrax tetrax*, and the eastern subspecies *orientalis*. There is but little outward difference, however, in these two genera beyond size, and I retain Blyth's classification for these bustards and place both our birds in the one genus.

The genus *Otis* may be distinguished from the other genera of this family by the fact that the crown of the head is never black, and only very short-crested, and the short, stout tarsus is only equal to one-fourth of the length of the wing.

The Great Bustard, *Otis tarda*, has practically no seasonal change of plumage, but the male of the Small Bustard, *Otis tetrax*, has one. Again, whereas the male of *Otis tarda* is much bigger than the female, the female of *Otis tetrax* is certainly as large as the male and sometimes somewhat larger.

Key to Species.

- Wing over 15 inches, generally between 18 and 25½ . . . *Otis tarda*.
Wing under 15 inches, generally between 9 and 11 . . . *Tetrax orientalis*.

OTIS TARDA TARDA.

THE GREAT BUSTARD.

Otis tarda.—*Linn. S. N.* i, p. 264; *Hume, Ibis*, 1871, p. 404; *id. S. F.* vii, p. 434; *Hume & Marsh. Game-B.* i, p. 1, pl.; *Hume, Cat.* No. 836 bis; *Sharpe, Cat. B. M.* xxiii, p. 284; *id. Hand-L.* i, p. 173; *Finn, In. Waders*, p. 116; *Oates, Game-B.* i, p. 394; *id. Cat. Eggs B. M.* ii, p. 84; *Willoughby Verner, My Life among the Wild Birds in Spain*, pp. 131 et seq.; *Chapman & Buck, Unexplored Spain*, p. 253; *Fooks, The Field*, February 11, 1911; *ibid.* September 16, 1911; *Stuart Baker, J. B. N. H. S.* xxi, p. 22 (1911); *Kinnear, ibid.* xxi, p. 268; *Hartert, Nov. Zool.* xxiii, p. 337; *Ludlow, J. B. N. H. S.* xxv, p. 305 (1917); *Thornhill, ibid.* p. 487 (1918); *Roos-Keppel, ibid.* p. 745 (1918).

Vernacular Name.—*Deo-dagh* (Chitralli).

Description. Adult Male.—General colour above sandy-rufous, broadly banded across with black, the bands very strongly marked on the upper back and scapulars, less so on lower back and rump; upper tail-coverts and tail-feathers light bay or vinous-chestnut, barred across with black, some of the bars broken up; the tail-feathers more or less distinctly tipped with white, the outer feathers white at the base, the three outermost almost entirely white, with a broad subterminal band of black; lesser wing-coverts like the back, with black bars less closely arranged than on the back; remainder of wing-coverts, bastard-wing and primary-coverts white, powdered with grey towards the end of the feathers; quills brown with white bases, the primaries whity-brown with white shafts, the outer web and the tips blackish; the outer secondaries blackish, white at the base, the white increasing in extent towards the inner secondaries, which have a gradually decreasing extent of black tip till the last feathers are quite white, the innermost secondaries being sandy-rufous barred with black like the back; crown of head light grey, becoming tinged with rufous on the hind-neck, which has numerous narrow black transverse bars; sides of face, ear-coverts, cheeks and entire throat light grey, with elongated bristle-like feathers on each side of the chin; lower throat orange-chestnut,



THE GREAT BUSTARD

Otis tarda tarda

forming a band across the fore-neck which is washed with light grey, the sides of the neck with numerous small bars of black; sides of upper breast sandy-rufous barred with black; remainder of under-surface of body pure white.

Colours of Soft Parts.—"Bill leaden-grey, horn-black at the tip, feet earthy-brown, nails horny-black, iris dark-brown, eyelid with white feathers." (*J. F. Naumann.*)

Measurements.—"Total length about 42 inches, culmen 2.1, wing 23.5, tail 10, tarsus 6." (*Sharpe.*)

Wing 533 to 635 mm., tail 223 to 280 mm., bill at front about 50 to 60 mm., and from gape 69 to 75 mm., tarsus 135 to 165 mm., mid-toe 63 mm.

Adult Female.—The female differs from the male chiefly in being considerably smaller and in having no whiskers. The chestnut band on the lower throat of the male exists in the female only as patches at the sides under the shoulders of the wings.

Measurements.—Wing 453 to 508 mm., tail about 203 mm., bill at front 48.2 to 53.5 mm., and from gape 69 mm., tarsus 114.3 to 113.2 mm., mid-toe 57 mm.

Young.—The crown of the head like the back, which is similar to that of the female but paler and less boldly marked with black; lower throat and fore-neck more or less washed with sandy-buff; the white of the wings is much marked with black, the bastard-wing is barred with rufous and brown and there is a certain amount of rufous on the greater wing-coverts.

Nestling.—Covered with light down, mottled with black.

According to Hartert the Great Bustard loses its moustache, the hairy feathers of the pouch, and the chestnut feathers on the breast after the breeding season; there are then only blue-grey feathers on these parts, but in early winter the nuptial dress begins to be gradually assumed, and the moustache, chestnut band, etc., are complete before the spring approaches.

Colonel Willoughby Verner in his most interesting book "My Life among the Wild Birds in Spain" makes the following remarks concerning the weights of Bustards:—

"The weight of a Bustard is a subject of which very varied accounts have been written. Apparently the unfortunate stragglers

which have from time to time visited England and have been promptly slain, must have been very young birds. Yarrell records males of only 16 lb. and females of 9 lb. to 10 lb., whereas the males in Spain commonly weigh between 20 lb. to 30 lb. and the females 12 lb. to 18 lb. Professor Newton mentions 22 lb. to 32 lb. as the average weight of European Bustards. The remarkable variations of weight in birds shot out of the same flocks and in the same localities lead me to believe that Bustards take very much longer to reach maturity than is popularly imagined. Again, they seem to vary enormously in weight according to the season of the year. Out of a number of Bustards I have weighed and examined, those killed in the winter months have averaged only about two-thirds the weight of those killed in March and April. The smallest Great Bustard I ever saw killed was a young female in the month of February, and which weighed only 12 lb. This bird must have been at least nine months old."

"Six old male birds shot by a party of three guns, of which I was one, in the month of April averaged over 34 lb. each, the heaviest being 37 lb.; no doubt the contents of the crops accounted for some of this great weight."

In 'Unexplored Spain' Messrs. Chapman and Buck give much the same weights. They say:—

"In weight, cock Bustards vary from 20 to 22 lbs. in autumn, up to 28 to 30 lbs. in April. The biggest old males in spring reach 33 and 34 lbs., and one we presented to the National Collection at South Kensington weighed 37 lbs."

"Hen Bustards seldom exceed 15 lbs. at any season."

The record in weight for a cock Bustard appears to be held by Colonel R. Whalley, who sends me the following extract from his diary: "May 19th, 1890. Shot a very large Bustard, which weighed 40 lbs., at Tapatanella, Mediana."

Distribution.—Sharpe gives the range of this magnificent bird as "Southern Europe and Northern Africa, extending to Central Asia and North-west India," and this range now includes Persia and Afghanistan. In the latter country it was obtained by the Afghan Delimitation Commission, and in the former it has now been several times taken; and I have eggs also thence.

To the east of this recorded range its place is taken by a very closely allied sub-species, *Otis tarda dybowskii*. This sub-species has no rufous breast-band in the male, and in that sex there is also a band of white or greyish-white formed by the median wing-coverts. The female differs from the female of *Otis tarda tarda*, if at all, in having the head a somewhat darker grey.

In India the Great Bustard has been obtained on only six occasions; on one of these, two females have been shot, on the other occasions, single females.

It was first obtained by Hume's collectors in 1870, and Hume thus records the event:—

“Once, and once only, as yet, has the Great Bustard of Europe been obtained within the limits of the British Empire in the East.

“On the 23rd of December, 1870, a couple of my collectors, who were working at Mardan, under the direction of Dr. J. A. Johnson, then of the Guides, came across a party of Bustard in some fields of mustard and giant millet, belonging to Hashtnagar, and just north of the Kabul river. The birds were very shy, but my old jamadar succeeded, by driving a buffalo in front of him, in getting within shot and knocking over a female.

“This Hashtnagar is within a few miles of the very most north-westerly point of British India proper, and is in lat. 34° N., and long. $7^{\circ}45'$ E.

“This party of Bustard did not leave the neighbourhood for some weeks, but they were so wary that, despite all the efforts of many sportsmen, native and European, no second specimen could be obtained; and, notwithstanding repeated subsequent inquiries from officers stationed at Mardan, Michni and Shabkadar, in the midst of which Hashtnagar lies, I have never been able to learn that the Great Bustard has again re-visited the locality.”

After this, its next record is that by Colonel Fooks, I.M.S., in the columns of ‘The Field’ of the 11th February, 1911, to which article my attention was drawn by Captain A. H. Mosse. Colonel Fooks’ interesting note is as follows:—

“*Great Bustard shot in India.*—The Great Bustard is a very rare visitor to India, only one specimen having been shot, in December, 1870. Now, after forty years, two others were shot on January 8th, by a duffadar of the 15th Lancers, near the place where the first was killed. It was very cold over the north of India about Christmas, the thermometer falling to within half a degree of the record, which accounts for their presence here, and also for some Mute and

Bewick's Swans which have lately been seen on the Kabul river near Risalpur. In North China I once saw a large number of the European and the Great Indian Bustards on the same ground. It was interesting to note the difference between them; the latter were always scattered when feeding, and rose and flew independently like houbara, the lesser bustard, but the former did not separate so much when on the ground, and rose and flew together more like geese although, of course, not in V formation. We do a great deal of hawking round here, especially houbara, and it is the greatest ambition to kill one of the great European Bustards with a saker falcon, but up to now no flight has been obtained at this fine species."

To this record Colonel Fooks adds in *epistolâ* :

"The Great European Bustards were first seen here about the 20th December, 1910, and migrated northwards again about the first week in February. I went after them several times to try and get a complete skin for the Bombay Natural History Museum, but was usually unable to find them when I had a gun, although I saw them several times when hawking houbara. We flew a goshawk at a flock (I don't know the right term) of eleven of them which we saw one day, but as the Great European Bustard keep together when on the wing, and do not separate like the Great Indian Bustard or houbara, I rather fancy the hawk was afraid to come to close quarters, although we had a flight of about three miles and nearly lost the hawk. A duffadar of this regiment shot two on the 6th January; they were both females and weighed $9\frac{1}{2}$ lbs. each. It is interesting to note that these were killed in the same neighbourhood as the only previously reported one was, forty years ago. I should think that probably about twenty-five of these birds were seen in this district, all told. I was able to recognize them before any were shot by their mode of flight, as they always keep more or less together on the ground and rise and fly together."

The fourth specimen shot within Indian limits was killed by Captain H. M. Symonds at Jacobabad, Sind, on the 12th January, 1911. As already stated this bird was a female and apparently not full-grown. It is said to have weighed 5 lbs. when cleaned, which would have given a weight of about 8 lbs. for the whole bird.

A skin of another young female was secured by Captain Lyall, Chitral, and sent to the Bombay Society's Museum. This bird was shot by Lieut. Stirling on the 30th March, 1911, and Captain Lyall in forwarding the specimen says in *epistolâ* :

"As far as I know the Bustard has not been recorded in Chitral, but I found that the Chitralis had got a name for the bird, 'deo dagh,' though it is said to be a rare one."

Finally Roos-Keppell records receiving a specimen of the Great Bustard at Peshawar on the 1st December, 1917. This is recorded as a male weighing 14 lbs.

It is interesting to note that all our records are of very young birds; a corroboration of the theory that young birds travel and migrate further than old ones.

Nidification.—The Bustard breeds all over Central and Southern Europe, where there is suitable country obtainable, and in former days was often known to breed in England, especially in the south-eastern counties. Its strongholds in Europe, however, are Spain and Central and Southern Russia. From Europe it extends to Northern Africa and through Asia Minor and Persia as far as the extreme north-west of India and into Afghanistan. The birds seen and recorded from Eastern Siberia and China as *Otis tarda* are the nearly allied sub-species, *dybowskii*, which is often not distinguishable from our bird.

During the courting season the male is said to display the most extravagant antics. Finn says that when courting "the male combines the extravagances of the pouter or fantail pigeons, besides turning much of his plumage the wrong way;" to this combination he may be said to add many of the courting attitudes of the turkey. Where there is a slight eminence handy, proceedings are usually commenced by the bird climbing up this and calling loudly until a female or females are attracted, when he descends and goes through a variety of strutting and bowing actions until he thinks he has won the heart of the coveted female. He also erects his feathers, spreads his tail and displays his wings in a trailing position and struts round his bride much as a turkey does. These actions and the curious twisting of the feathers are most beautifully shown in a plate opposite p. 260 in 'Unexplored Spain,' and this plate also shows how the general appearance becomes white during the pre-nuptial contortions and displays.

The Bustard is polygamous, but it is rather unfair to the male to leave the matter thus; for there is no doubt that the female will

accept the attentions of any male who can succeed in conquering her husband for the time being and adopting his harem. The males fight desperately during the breeding season, and are said by some observers often to seriously injure one another. This, however, hardly agrees with Colonel Verner's amusing description of the fights. He writes:—

“One of the most perplexing traits in the Bustard's character is that he by no means confines the period of these antics to the season of courtship. Long after the females have settled down to their eggs in the far distant corn-lands the males, congregated in big flocks, will continue to indulge in their frenzied movements, which, so far as I have ever been able to see, are purely games of ‘bluff’ and ‘swagger’ which never lead to more than a momentary encounter—a sort of collision and ‘fend off’ with another bird, after which both turn about and continue their absurd movements independently. When one watches such an encounter, one can almost imagine one inverted old cock saying to another: ‘You be off!’ ‘I won’t!’ replies Number Two. ‘What! *you won’t?*’ thunders Number One, rustling up to him with creaking primaries and a generally appalling appearance. ‘No!’ says Number Two, equally crackling all over and strutting around ferociously. ‘*Then stay where you are,*’ remarks Number One, wheeling about and adroitly evading the difficulties of the situation.”

The nest, if such it can be called, is merely a depression in the soil either natural or scratched in loose sand or earth by the bird itself. As a rule, the site selected is in some field of grain or in scrub grass sufficiently high to conceal the sitting bird and its eggs; but sometimes it is in comparatively or quite open country, only screened from sun and enemies by a stunted bush or two or a small patch of withered grass. The hen is said to be a close sitter, once the eggs are advanced in incubation, but when newly laid she leaves them at the first signs of danger, and, slinking through the cover, if there is any, takes to wing far from their vicinity.

As with other polygamous birds, the male takes no interest in the hatching of the eggs or bringing up of the chicks, and these duties are left entirely to the female.

The eggs are generally laid in May, the time merely varying according to the latitude. In the bird's more northern habitat no eggs will be found until well on into May, whilst many may be taken

in June; on the other hand, in Northern Africa, South Russia and Asia Minor, it is said sometimes to lay in the end of April, and eggs have been taken in North Africa as early as the first week of that month.

The normal clutch of eggs has been generally held to be two, and occasionally but one egg is incubated. On the other hand, three eggs are often laid in a clutch, and four and even five eggs have been taken from the same nest. There are two clutches in the British Museum, both in the Seeböhm collection, which contain three eggs, one taken at Halberstadt, Germany, on the 22nd May, and the other at Choousk-Keui, Asia Minor, on the 11th May.

Both Colonel Verner and Colonel Irby, however, consider three or four the normal clutch. The former says:—

“It is well known to all interested in bird life that when once a ‘fact’ regarding natural history has been duly recorded it takes a long time to disprove it, successive authorities being content to quote from one another without seeking for further information. Among such is the generally accepted statement regarding the number of eggs laid by the Great Bustard, which has been recorded as two from time immemorial, with the explanation that when four eggs are found in a nest, ‘no doubt two females have laid in it.’ In consequence, when I first saw a nest with four eggs I duly noted the fact and entered the usual stock explanation in my diary. By good chance my notes some years later were read by the late Lord Lilford, undoubtedly one of the best authorities on the birds of the Spanish Peninsula, who very kindly pencilled across the page: ‘The Great Bustard often lays four and rarely five eggs. L.’”

“Some years later I met with a second nest with four eggs, as recorded by Colonel Irby.”

“After Colonel Irby’s book appeared, I on several occasions found Bustards’ nests with three eggs, not four, sometimes considerably incubated, but it was not until last year that after a long interval I chanced to be among the Bustards at the right time. In May, 1907, in one beanfield, I came across no fewer than four nests containing respectively four, three, three, and two eggs. The set of four were somewhat incubated, as were one of the sets of three, the remainder being quite fresh.”

“My conclusion, based on many years’ experience, is that Great Bustards commonly lay three or four eggs, but in some instances they only lay two, though in others even five eggs.”

Normally the eggs of the Great European Bustard are broad

ellipses in shape, rarely oval, and still more rarely with both ends somewhat pointed. Dresser in 'European Birds,' gives the greatest and least dimensions of ten as $3\cdot47 \times 2\cdot18$ inches and $3\cdot075 \times 2\cdot075$ respectively. In his 'Palæarctic Birds,' he gives the average as $3\cdot22 \times 2\cdot12$.

The twenty-six eggs in the British Museum collection vary between $2\cdot7$ inches ($= 68\cdot6$ mm.) and $3\cdot35$ ($= 85\cdot1$ mm.) in length and between $2\cdot0$ ($= 50\cdot8$ mm.) and $2\cdot4$ ($= 60\cdot9$ mm.) in breadth. I have no eggs as large as the largest of Dresser's in my collection, but I have a pair from South Russia which measure only $2\cdot65 \times 1\cdot98$ ($= 67\cdot3 \times 50\cdot3$ mm.), and $2\cdot63 \times 1\cdot99$ ($= 66\cdot8 \times 50\cdot5$ mm.). These are unusually small, almost abnormal eggs.

The ground-colour varies very much, it may be a dark stone-colour, grey-stone, dull olive-grey, or olive-brown, olive-buff or even olive-brown with a tinge of yellow; nine eggs out of ten, however, will be found to be olive, either olive-brown or olive-grey, more often the former, though even this will vary considerably in depth and richness of tone. Dresser says that sometimes the ground-colour may be an almost uniform dull bluish, but in the very large series I have examined lately I have seen none such. The marks consist of blotches, smudges and clouds of dull-brown of various shades and density, sometimes reddish and occasionally purplish. These are seldom very numerous and sometimes very scanty, and are distributed fairly evenly over the whole surface of the egg, being but rarely any more thickly scattered over the larger end than elsewhere.

The secondary or underlying spots are of paler brown and grey, as a rule the latter colour predominating. These markings are often tinted with purple or pink and are generally less well-defined than the superior markings. I have seen a few eggs which have, in addition to the markings already described, a few streaks and lines of very deep rich brown, in one or two almost black.

The texture is rather coarse, but extremely close and hard, and most eggs carry a very fine gloss, though this varies and is sometimes practically absent.

General Habits.—In its general habits the Great Bustard closely resembles our Great Indian Bustard, but the few occasions on which it has been seen in India have not given much opportunity for

observation, and it is on European authors, therefore, that we must rely for information.

Dresser, in 'European Birds' gives the following interesting account of the habits of the Great Bustard:—

"The Great Bustard frequents open, flat ground, preferring grassy plains or cultivated land, but avoiding localities near human habitations, and places where there are trees and bushes and where it cannot command an uninterrupted view over a large tract of country. It is peculiarly wary and shy; and it is almost impossible to approach it within gun-shot range. Hilly country, and especially mountains, it avoids altogether, and is never met with in the woodlands and forests. It specially frequents cultivated fields, and is often found in those where rapeseed, wheat and rye have been sown. It passes the night in the open fields, choosing places where it cannot be approached without taking alarm, and is so watchful that it is impossible to surprise it when asleep. It leaves its night-quarters at the first break of dawn, and during the hot summer days will often take a siesta during the hottest part of the day, but it is then equally wary and difficult of approach. It flies with more ease than one would imagine, considering the size and weight of the bird, and has no difficulty in taking wing, at once springing up into the air without first taking a step or two, and appears to prefer seeking safety in flight rather than by making use of its legs. When it flies it stretches out its neck and legs and is thus easily distinguishable. . . . Early in spring, according to the mildness of the season, they commence to prepare for the cares of nidification; and the flocks then by degrees break up. The males fight desperately for the possession of the females, and may at that season of the year be seen strutting about, acting not unlike a turkeycock."

As regards its flight all authors do not agree with Dresser, and some have remarked that this Bustard has to run a step or two before it can raise itself on the wing. Probably a good deal depends on the breeze, as a head-wind would help the bird to get the use of his wings at once. Also, a bird suddenly startled would use an extra effort and start into flight from where it stood, whereas a bird rising under ordinary circumstances might take matters more leisurely and run a pace or two before exerting itself to take to flight.

Colonel Verner says that:—

"The flight of the Great Bustard is extraordinarily quick and without effort. Before they take wing they simply walk for a few

paces—no attempt at a run—and, opening their white wings, flap away in what appears to be a most leisurely manner. Save when there is a strong wind, or when coming off higher ground, they rarely fly more than 30 yards above the ground, and hence when they take the right direction afford good driving shots. Nothing, however, is more deceptive than the pace they fly at, for owing to the steady beats of their immense pinions, some 8 feet across, they seem to the eye to be moving slowly; but they are not.

“To appreciate the extraordinary speed they travel at it is necessary to have a bird pass close over one. More than once when lying absolutely prone on my face amid a few dead thistles . . . a Great Bustard has passed only a few yards above my lair, at times coming from behind or from some unexpected quarter whilst all one's energies were concentrated in the direction whence the driven birds were expected. On such occasions before one can alter one's position and rise to shoot, it has passed out of shot!”

Messrs. Chapman and Buck's description agrees well with that of Colonel Verner:—

“Two quick steps and a spring and the broad wings of every bird in the pack flap in slowly rising motion.”

Later on in the book p. 252 they add:

“Tardy strokes deceive the eye, and the great bulk of the Bustard accentuates the deception—it seems impossible to miss them, a fatal error.

“Yet geese with their 40 strokes fly past ducks at 120, and the Bustard's apparently leisured movement carries him in full career as fast as whirring grouse with 200 revolutions to the minute. To kill bustard treat them on the same basis as the smaller game that appears faster but is not.”

In former times the Bustard was considered a great delicacy for the table, as, indeed, were many other birds which it would take a very hungry man to tackle now-a-days. As also with many other birds, recent diet has much to do with its flavour, and whilst often its flesh may be found quite palatable, at other times it may be almost uneatable. Oates says:—

“The Great Bustard has a peculiar and very disagreeable smell when alive, and its flesh is not now held in much esteem. Dr. E. T. Aitchinson informs us that when he was on the Afghan Delimitation Commission, a flock of these Bustards was met with, and Lieut. Rawlins succeeded in shooting one, but the stench of the bird was so

great he almost thought of leaving it; it was so dark that he scarcely knew what it was that he had got, and the scent was almost enough to put off anyone from even a new acquisition. Notwithstanding this, however, we are told that the flesh was eaten next day and found excellent."

Finn, in his 'Indian Waders,' also comments on this curious smell of the Bustard, and suggests that it may be this which accounts for the strange antipathy which is alleged to exist between horses and Bustards. He quotes Pallas as saying in his '*Zoographia Rosso-Asiatica*' that horses will trample on sitting hens should they get the chance, and he adds that Bustards have got into trouble in England by attacking horses.

It is said that Bustards have been captured by being run down on horseback and this may be true when they are found in places where relays of horses and horsemen can take up the pursuit, otherwise it seems incredible that birds of such power of wing should be thus tired out and caught. They can certainly fly faster than any horse can gallop across country, unless for a very short distance, and if not at once put up by a fresh horse and rider and forced to fly again, would have ample time to recover before their exhausted pursuer could come to close quarters.

During the non-breeding season the Bustard is generally found in flocks (or droves, as flocks of these birds are usually termed). These droves may number anything from half a dozen to twenty birds, but, according to some authors, they are often seen together in much larger numbers than this, and Hume speaks of parties of fifty Bustards being seen together; whilst Colonel Willoughby Verner speaks of having himself seen seventy-four birds together in Andalusia; and Colonel Irby records that: "Bustards are usually found in troops varying from half a dozen birds to as many as fifty or sixty, and in September we have seen 200 together." Very often these droves may break up and scatter over a large area of country when feeding, but when disturbed, leaving the ground for some other, they again unite and fly off together.

Bustards are very omnivorous, but their food undoubtedly consists mainly of grasshoppers and other insects, in addition to which they eat all sorts of grain and a good deal of green vegetable matter.

When hungry or at all hard-pressed for food they will eat worms, small lizards, snakes, small mammals, such as shrews, mice, &c., and also the eggs of such other birds as deposit them on the ground. They have, like others of this family, a quaint habit of picking up and toying with any small bright object they may come across and also of swallowing the same, either by accident or design. Small pebbles, also, have often been taken from the internal arrangements of Bustards, but these are probably only swallowed as an aid to digestion. The specimen shot by Hume's collectors was found to have been feeding entirely on green mustard leaves.

The Bustard is believed by many writers never to drink, and probably it does so very seldom, but Finn has observed this bird drinking when in confinement in the Zoological Gardens in London, and its not drinking may be a habit from which it departs where water is plentiful. According to Messrs. Chapman and Buck the fact that it does drink often leads to its destruction. They write:—

“There is, however, one period of the year when the Great Bustard falls an easy prey to the clumsiest of gunners.

“During the long Andalusian summer a torrid sun has shrunk up every brook and stream that crosses the cultivated lands; the chinky, cracked mud, which in winter formed the bed of shallow lakes and lagoons, now yields no drop of moisture for birds or beasts. The larger rivers still carry their waters from sierra to sea, but an adaptive genius is required to utilise these for purposes of irrigation. All water required for the cattle is drawn up from wells; the old-world lever with its bucket at one end and its counterpoise at the other has to provide for the needs of all. These wells are distributed all over the plains. As the herdsmen put the primitive contrivances into operation and swing up bucketful after bucketful of cool water, the cattle crowd around, impatient to receive it as it rushes down the stone troughing. The thirsty animals drink their fill, splashing and wasting as much as they consume, so that a puddle is always formed about these *bebideros*. The moisture only extends a few yards, gradually diminishing, till the trickling streamlet is lost in the famishing soil.

“These moist places are a fatal trap to the bustard. Before dawn one of the farm people will conceal himself so as to command at a short range all points of the miniature swamp. A slight hollow is dug for the purpose, having clods arranged around, between which the gun can be levelled with murderous accuracy. As day begins to dawn, the bustard will take a flight in the direction of the well,

alighting at a point some few hundred yards distant. They satisfy themselves that no enemy is about, and then with cautious, stately step, make for their morning draught. One big bird steps on ahead of the rest, and as he cautiously draws near, he stops now and again to assure himself that all is right and that his companions are coming too—these are not in a compact body, but following at intervals of a few yards. The leader has reached the spot where he drank yesterday; now he finds he must go a little nearer to the well, as the streamlet has been diverted; another bird follows close; both lower their heads to drink; the gunner has them in line—at twenty paces there is no escape; the trigger is pressed, and two magnificent bustards are done to death. Should the man be provided with a second barrel (which is not usual), a third victim may be added to his morning's spoils."

Messrs. Chapman and Buck also describe a second method which the Spanish cultivators and cattlemen employ in winter. This is shooting them at night with the assistance of a dark lantern, much in the same way as in India our cultivators in many parts of the country kill deer, or as poachers in Wales spear salmon.

To cover their movements and to lull the suspicions of the Bustards, the cattlemen carry on their wrists a cattle-bell or *cencerro* to which the Bustards are accustomed and of which they have no fear.

Many hens and young birds are also killed by so-called sportsmen during the breeding season, when the hens sit close and the young are not sufficiently advanced to seek safety in flight.

The two legitimate means of obtaining this grand game-bird are by driving and—a less sporting method—by working them in a grain-cart as one shoots Black-buck in India. The latter method requires no description, for it is well known to most sportsmen in India, but the driving of Bustard requires so much special care and so much local knowledge that I again indent on Messrs. Chapman and Buck for their most interesting account of such a drive:—

"The district having been selected, it is advisable to send out the night before a trustworthy scout who will sleep at the *cortijo* and be abroad with the dawn in order to locate precisely the various *bandadas*, or troops of bustard, in the neighbourhood. The shooting party (three or four guns for choice, but in no case to exceed six) follow in the morning—riding, as a rule, to the rendezvous.

"Arrived at the *cortijo*, the scout brings in his report, and at once guns and drivers, all mounted, proceed towards the nearest of the marked *bandadas*. . . . The drivers should number three—the centre to flush the birds, two flankers to gallop at top speed in any direction should the game diverge from the required course or attempt to break out laterally.

"Ten minutes' ride and we are within view of our first *bandada*, still a mile away. They may be feeding on some broad slope, resting on the crest of a ridge, or dawdling on a level plain; but wherever the game may be—whatever the strategic value of their position—at least the decision of our own tactics must be clinched at once. No long lingering with futile discussion, no hesitation, or continued spying with the glass is permissible. Such follies instil instant suspicion into the astute brains on yonder hill, and the honours of the first round pass to the enemy.

"For this reason it is imperative to appoint one leader vested with supreme authority, whose directions all must obey instantly and implicitly.

"The thoughts revolving in the leader's mind during his brief survey follow these general lines: First, which is (a) the favourite, and (b) the most favourable line of flight of those bustards when disturbed; secondly, where can guns best be placed athwart that line; thirdly, how can the guns reach these points unseen? A condition precedent to success is that the firing line shall be drawn around the bustards fairly close up, yet without their knowledge. Without a halt the party ride round till out of sight. At the furthest safe advance the guns dismount and proceed to spread themselves out—so far as possible in a semi-circle—around the focal point. At 80 yards apart each lies pressed on the earth, utilizing such shelter (if any) as may exist on the naked decline—say skeleton thistles, a tuft of wild asparagus, or on rare occasions a natural bank or tiny rain-scoop.

"Now we have placed our guns in line and within that short distance of the unsuspecting game that all but assures a certain shot. We cannot, let us confess, recall many moments in life of more tense excitement than those spent thus, lying prone on the gentle slope listening with every sense on stretch for the cries of the galloping beaters as in wild career they urge the huge birds towards a fatal course. Before us rises the curving ridge, its summit sharply defined against an azure sky—azure but empty. Now the light air wafts to our ear the tumultuous pulsations of giant wings and five seconds later that erst empty ether is crowded with two-score huge forms. What a scene—and what commotion as, realizing the danger, each great bird with strong and laboured wing-stroke swerves aside. One enormous *barbon* directly overhead receives first atten-

tion; a second, full broadside, presents no more difficulty, and ere the double thuds behind have attested the result, we realize that a third, shying off from our neighbour, is also 'our meat.' "

The last attempt to reintroduce this grand game-bird into England was in 1900, when the late Mr. Alexander Williams imported sixteen birds which were, in the words of the 'Field,' "accorded full measure of care and hospitality on a large estate on the borders of Suffolk, where they received ample protection within the limits of an area of some 50,000 acres, owned by good sportsmen with a friendly interest in natural history."

In the 'Field' of the 16th September the unfortunate results of this experiment were thus recorded:—

"Sad to say, the precautions thus taken proved in vain, for it was found impossible to induce people to leave the birds alone. Within a few months of their liberation two of them were shot by a keeper at Finningham on June 20th, 1901, and another by a farmer near Cambridge. The Bustard being a game-bird within the definition of the principal game act, which prohibits its destruction during the close time, the two delinquents were prosecuted and fined, but unfortunately that did not save the birds. Others disappeared, and were heard of considerably to the westward, two being seen in South Wales, where one of them was killed, the survivor being subsequently shot in south-east Ireland, and both were preserved by a well-known taxidermist in Dublin. Some may have died a natural death, or by accident. At any rate, the birds came to an untimely end, and it is a deplorable fact that, after all the trouble and expense incurred, the experiment proved abortive. This is the more to be regretted because as we are informed, some nests were found, and of one of them a photograph . . . was taken. This was found on the Elveden estate in April, 1901."

OTIS TETRAX ORIENTALIS.

THE LITTLE BUSTARD (EASTERN FORM).

Otis tetrax, Linn. S. N. i, p. 264 (1766); Jerdon, B. of I. iii, p. 625; Blyth, Ibis, 1867, p. 163; Beavan, *ibid.* 1868, p. 388; Blanford, East Pers. ii, p. 287; Scully, S. F. iv, p. 184; Hume, *ibid.* vii, p. 435; Hume & Marsh. Game-B. i, p. 3; Hume Cat. No. 836; *ibid.* S. F. viii, p. 111; Biddulph, Ibis, 1881, p. 84; Scully, *ibid.* p. 586; Swinh. *ibid.* 1882, p. 119; St. John, *ibid.* 1889, p. 175; Sharpe, Yark. Miss. Aves, p. 145; Blanford, Avifauna B. I. iv, p. 193; Finn, In. Waders, p. 118; Ward, J. B. N. H. S. xvii, p. 945; Mitchell, *ibid.* xx, p. 1154; Stuart Baker, J. B. N. H. S. xxi, p. 38 (1911); Ludlow, *ibid.* xxv, p. 394 (1917); Thornhill, *ibid.* p. 487 (1918).

Tetrax tetrax, Sharpe, Cat. B. M. xxiii, p. 287; *ibid.* Hand-L. i, p. 174; Oates, Cat. Eggs B. M. ii, p. 85; *ibid.* Game-Birds, i, p. 409.

Otis tetrax orientalis, Hartert, Nov. Zoo. xxiii, p. 339 (1916).

Vernacular Names. *Chota tilur*, Obara (Punjabi); *Kum-tokosi*, Turki, *Charaz* (Baluchi).

Adult Male in Breeding Plumage.—General colour above sandy-buff, coarsely vermiculated with black, and also showing some black blotches in the centre of the feathers; rump a little greyer than the back, the feathers being freckled with whitish instead of sandy-buff; upper tail-coverts white or white mottled with a few blackish markings; wing-coverts like the back, but somewhat more sparsely vermiculated with black; lesser and median coverts white at the tips, and more or less freckled with black; the external coverts, bastard-wing and greater coverts pure white, the inner ones slightly freckled or spotted with blackish; primary-coverts blackish, narrowly tipped with white; quills white, mostly blackish towards the ends, the tips of these feathers being again white, so that the black mark becomes subterminal; the outer primaries blackish with white bases, the white gradually increasing towards the secondaries, which are almost entirely white with an occasional spot of black. Innermost secondaries like the back; tail-feathers coarsely freckled with black on a white ground and crossed by four distinct bars of blackish,



THE LITTLE EASTERN BUSTARD

female	male
Otis terrax orientalis.	
Life size	

which are very pronounced on the basal half of the tail, which is white without any blackish frecklings, the outer feathers broadly tipped with creamy-white; crown of head, nape and hind-neck brown, mottled with streaks and edgings of sandy-buff, with a few blue-grey feathers intermixed; lores and sides of crown pale sandy-buff streaked with dark brown; feathers above and round the eye uniform creamy-buff; sides of face, ear-coverts, cheeks and throat light bluish-grey, which is bordered by a broad band of black extending from the sides of the hind-neck diagonally across the latter and uniting in a broad band which runs down the centre of the lower throat; around the hind-neck and occupying the sides of the latter is a broad extent of black which unites on the upper fore-neck; this is bordered above by a broad band of white which encircles the hind-neck, separates the black on the sides of the neck, and descending on the latter to the lower throat, unites there in a point; across the lower fore-neck a broad black band, which is separated from the lower throat by a band of white which traverses the fore-neck also; remainder of under-surface pure white; sides of the upper breast sandy-coloured and mottled with black like the upper parts; under wing-coverts, axillaries and quill-lining pure white.

Adult Female.—Whole upper surface rich buff or rufous-buff, vermiculated with black and with black central lines here and there widening into blotches; on the hind-neck the markings are very fine and the buff replaced by brown; the black markings on the crown form irregular bars; lesser wing-coverts like the back but less profusely marked with black, median coverts the same but with still less black and with the buff becoming almost white at the tips, greater coverts white with dark brown or blackish shaft-streaks and with a few scattered specks and spots of black which become regular sub-terminal bars on the innermost; primaries dark-brown mottled with white at the tips and with white bases, concealed on the outermost but increasing in extent until the innermost are nearly all white, outer secondaries white, with specks and bars of black at wide intervals, inner secondaries like the back. Chin and upper throat dull buff or brownish-white, the under-neck the same streaked with black and buff; sides of head like throat but streaked finely with black; lower throat and breast dull pale buff, the former streaked and the latter barred

with black. The centre of the breast is generally nearly white, as is the lower breast, and the bars are wider apart. Under the wing the buff extends down the breast for some two or more inches; remainder of under-parts, flanks and under wing-coverts white; some of the feathers of the flanks with black shafts and here and there a black spot.

Male in Winter.—Resembles the female but the vermiculations are finer and the black markings less bold. The black crescentic marks on the lower breast are also less defined and regular.

Hartert says that the nuptial plumage is assumed in the spring by a partial moult, affecting only the body-plumage and neither wings nor tail.

Young.—"Generally distinguishable from the adult by the greater amount of barring on the chest, by the more profuse barring on the upper tail-coverts and the sandy frecklings of the primary-coverts." (*Sharpe.*)

"The young birds of both sexes are like the adult female, except that the outer webs of the first primary and the primary-coverts have rusty markings."

The Indian subspecies differs from the western form in being rather darker on the upper side, less sandy and less reddish, especially on the upper wing-coverts; the markings are as a rule somewhat coarser.

Colours of Soft Parts.—"The colours of the soft parts vary a good deal; the legs and feet are yellow, dusky-yellow, greenish-yellow, the feet often browner and dingier; the bill is blackish, greenish-black, dusky-horny or brown, generally paler on culmen, and bluish-grey, greenish or yellowish at the base, and the irides vary from light yellow to orange." (*Hume.*)

J. F. Naumann says the irides of the young are brownish-yellow.

Measurements.—In this species, unlike *Otis tarda*, there is little difference in size between the sexes, and whereas in that bird the male greatly exceeds the female, in this the male averages but little heavier or bigger. Hume says in regard to Indian birds, "I do not find the sexes differ materially, although the males unquestionably average rather larger and are perceptibly heavier."

"The following are dimensions, etc., recorded of Indian speci-

mens: Length 17 to 19 inches, expanse 33·5 to 36, wing 9·5 to 10·1, tail 4 to 5, tarsus 2·2 to 2·66, bill from gape 1·5 to 1·6. Weight 1·5 to 2 lbs."

Reduced to millimetres the wings are from 241 to 256. Hartert gives the wings of the eastern form as being, males 236 to 252 mm., and the females 245 to 247, measurements considerably smaller than those of Hume.

Sharpe notes some curious measurements in the 'Catalogue'; he gives the culmen of the male as 1·5 inches and that of the female 1·1, but the wing of the male as averaging 9·4 inches whilst that of the female is 9·7.

Distribution.—Hume, as usual, gives a good and detailed account of the habitat of our Indian race of *Otis tetrax*, both in reference to its whole range and its occurrence within Indian limits. He writes:—

"The Butterfly Houbara, as Indian sportsmen in the North-West have not inappropriately designated the Little Bustard of Europe, is a regular and tolerably abundant winter visitant to the northern portions of the Trans-Indus Punjab.

"Cis-Indus, they can only be considered rare and occasional stragglers. In December, 1878, Colonel Macleod, R.A., shot a fine male of this species near Gurdaspur, and about the same time Mr. O. Greig shot a female at Balawala on the bank above the Ganges Kadar in the Saharanpur district, and others must doubtless have occurred in the submontane tracts of the Punjab and North-Western Provinces; these are, I believe, the only instances on record of their being brought to bag.

"Out of India, the Little Bustard is common in suitable localities in Southern" [Eastern] "Europe, . . . adjoining the basin of the Mediterranean. It straggles to Northern Europe, even to the British Isles and Sweden. It occurs, and very numerous in some places, in Syria, Asia Minor, the Caucasus, Northern Persia, Kabul and Northern Beluchistan, and throughout the tract of country lying between the Caspian and Western Yarkand, whence we have specimens from Yangihissar, Kashgar and other places in the plains between these and Sanju.

"It does not appear to go north across the Tian Shan, or eastwards into Mongolia or China; neither Radde, Prjevalski nor David include it in their lists."

A remarkable extension of this bird's range is made by records of three birds obtained in Kashmir. The first of these refers to one

obtained by Colonel A. E. Ward, near Hajan, Kashmir, in December, 1906, and recorded in Vol. xvii of the 'Journal of the Bombay Natural History Society'; the other two are recorded by Mr. F. J. Mitchell in Vol. xx of the same journal. Of these two latter, one was shot by Major Brown during a duck drive on the Hooka Sar Jhil in 1910, and the second by Major Smith near the Woolar Lake in early 1911.

Hartert defines the range of the eastern form as follows: "The eastern sub-species nests in Siberia, eastwards to Kainsh in the Tomsk Government, to the Sainan-Nor, Afghanistan and East Turkestan, westwards through Transcaspia, the South Russian steppes to the Government of Kiew, Poltawa, Podolsk, and perhaps Sarataw, Samara, and Orenburg to Greece, Rumania, the valley of the Danube to Austria. I suppose that also the Little Bustards which breed occasionally, though apparently irregularly, in Poland, probably in East and certainly once in West Prussia, in the Mark Brandenburg and Thuringia, as well as others in Sardinia, Sicily, and certainly those that nest in Puglie and Capitanta, near Foggia, in South Italy, belong to the eastern race."

The Little Bustard is, of course, only a cold-weather visitant to India, arriving early in October and leaving in March, occasionally staying as late as the first week or two in April. These dates are very rough, but there is a curious absence of all records as to this bird's appearance and disappearance from Indian limits, and an almost equal lack of accounts of its ever being shot or hawked.

Nidification.—Dresser says that during the breeding season the male has a harsh cry which may be syllabized as *trec, trec*, and which can be heard from a great distance, and Colonel Willoughby Verner says that when alarmed, the Western Little Bustard "utters a loud guttural rattling cry, somewhat similar to that of a grouse calling in early morning and even more like that given by the Bustard which we came across on the veldt between the Orange and Modder Rivers during the eventful days of November 1899."

The Lesser Bustard, like other birds of the family, is generally considered to be polygamous, and constant fighting between the males goes on throughout the breeding-season for the females, who appear to be indifferent to what male takes them as long as they

have a husband of some kind. Messrs. Chapman and Buck, however, disagreeing with the above, write: "They are strictly monogamous, yet the males 'show off' in the same fantastic way as Great Bustard and Blackcock."

In the more northern parts of its breeding range the eggs of the Little Bustard are laid late in May and early in June, but further south most will be found in the first fortnight of May and some in the end of April.

I have eggs from East Prussia, dated 26th June, and another clutch from Italy, dated 13th April.

Their breeding habits and nidification, if such it can be called, seem to closely resemble those of the Great Bustard. There is no nest, though sometimes the depression which contains the eggs may be more or less filled up with grass and weeds, and the constant lying on this may have formed it into a hollow cup. They select, or themselves make, this depression either in standing crops of grain or mustard or under shelter of a bush or patch of grass in an open plain, and the hen sits very close when once incubation has begun.

Colonel Verner thus describes the nests of the Little Bustard taken by him in Spain, and the description would stand equally well for those of our Eastern form.

"Few nests are more difficult to find than the Little Bustards', especially when they are amid the rank herbage on the fallow lands or the asphodel, when they are as well concealed as a Partridge's or Quail's. They are almost equally baffling when on the plains amongst the thousands of acres of waving reeds, 2 ft. or 3 ft. in height, which permit of the old bird running for an indefinite distance from the nest before taking wing. The same remark applies to those placed amongst the standing corn.

"The nest varies much in its size and construction, being at times a well-compacted mass of dried grasses and herbage and in others little more than a chance collection of *débris*. Where a nest is well concealed, the female will sit very close and not betray its situation until almost trodden upon, whereas in more exposed situations she usually slips off and, crouching, runs some distance before taking wing.

"The nest here shown was amidst a dense growth of coarse herbage, in which ox-eye daisies and dandelions predominated. The bird only left when I was within 2 feet of her and in her scuffle and alarm drove a claw through one of the eggs. To get a photograph

of this nest, we had to clear away much of the surrounding herbage. The nest was only a slight depression measuring 8 inches across and was lined with grasses and herbs pressed down around it.

"The day I found this nest with two eggs was dull and wet with heavy gusts of wind. . . . It was 18th May and . . . a few hours later on the very same day I came across a second nest about three miles from the first one. It would be hard to imagine a greater contrast than it presented, for it was on a bare and open hillside, fallow ground with practically no cover on it save that afforded by some scattered patches of rank herbage. The nest was constructed in one of these patches and was quite open to view to any passer-by, as can be seen from the picture. The cup of the nest was much deeper and better-finished than the cup of the first one, being well lined with grasses. The adroitness of the Little Bustard is shown by the fact that despite the open nature of the ground around this nest, and of my keeping a sharp look-out, we never saw her leave it, and she took wing from a point just twenty-three yards (measured) from one side of it."

The number of eggs laid is generally four, but five eggs have been taken in the same clutch, and three are often found, whilst sometimes only two have been incubated.

Aksakoof, as quoted by Dresser, gives the number of eggs laid as from eight to twelve, but this, of course, is incorrect and is probably due to a mistake of some kind, as even clutches of five eggs are exceedingly rare.

Oates, in his British Museum Catalogue of Eggs, thus describes the eggs of *Otis tetrax* :—

"The eggs of the Little Bustard are of a short pointed oval form, frequently elliptical and sometimes spheroidal. They are highly glossy. The ground is dark olive-green or olive-brown, and occasionally of a buff colour, and this is marked with streaks, clouds and blotches of very pale reddish-brown or yellowish-brown. The underlying markings are hardly separable from the ground colour. Many specimens are marked so faintly that they appear to be quite plain-coloured; but when closely examined the markings can always be made out. The eggs measure from 1'92 to 2'23 in length, and from 1'43 to 1'6 in breadth."

In addition to the ground-colours mentioned above, I have one clutch which is a pale french-grey with the markings very pronounced and dense, and two others again which might be termed olive-blue, upon which the markings, though faint, contrast well and distinctly with the ground colour.

I have no eggs of the shape Oates describes as "short, pointed oval," mine all being spheroidal, or nearly so.

The texture is much finer and closer than that of the egg of the Great Bustard and the egg is more consistently highly glossed.

My eighteen eggs of the Eastern Little Bustard average 1.92×1.44 inches ($= 48.8 \times 36.6$ mm.) and Dresser gives the average of his eggs for both the western and eastern forms as 1.95×1.45 inches ($= 49.5 \times 36.8$ mm.).

General Habits.—One of the best general accounts of this bird's habits, &c., is that given by Seebohm and quoted by Oates on pp. 410-11 of 'Game-Birds.' Seebohm writes as follows:—

"It is a partial migrant, arriving at its breeding-grounds in flocks early in April, which are dispersed in May. It is so much less than the Great Bustard, that by the middle of May the grass and the flowers hide it completely from view. The females sit very close and are difficult to find, but the males betray themselves by their curious notes. As you drive slowly across the steppes, your attention is arrested by a distant cry, resembling the sound of the syllable spurtz. By following with the wagon in the direction whence it proceeds for a hundred yards or more, you may generally put up the bird, frequently within shot, but if followed on foot there is little or no chance of securing it. The flight is quite different from that of the Great Bustard, more resembling that of the partridge than that of a heron. The wings are moved with great rapidity and the flight is very straight, though not very slow. The beats of the wing are so rapid that they make quite a loud whirring sound, and they show more white when flying than the Great Bustard does. In many respects their flight resembles that of a butterfly or of a snow-bunting. We never saw two males together during the breeding-season. The nest can only be found by accident. We were driving rather quickly across the steppe, anxious to reach Kalarath before dark, when suddenly a female Little Bustard rose within 10 feet of the wagon and was speedily dropped by our Jäger, who was sitting gun in hand by the driver. We jumped out of the carriage, and in a quarter of a minute found the nest, containing four eggs. The hollow was deeper than that of the nest of the Great Bustard, and there was a distinct nest of dry grass and weeds, though very slight; it was about 7 inches across and well concealed by tufts of a kind of lucerne."

Hume says that:—

"At times, especially early and late, they are very wary, but at other times, chiefly, I think, when the sun is high and hot, they will lie as close as a button quail.

“They are often shot, bags of ten or a dozen couple having been reported; but it is chiefly as a quarry for falcons that they are esteemed, and in the neighbourhood of Mardan, hawking with the Saker or Cherrug falcon used to be a standing amusement.

“They are broad-breasted, compact, strong birds, but withal easily killed, though perhaps less so than the Florican.”

The food of the Little Bustard is as varied as that of its big cousin, and though it lives principally on grain and green food it will devour anything in the insect line, and also slugs, snails, worms, and even small lizards, frogs, &c.

As an article for the table, opinions differ greatly, but whilst many consider it a delicacy, few condemn it altogether, and it certainly ranks as food not to be despised when once it has been shot. Messrs. Chapman and Buck declare, of its Spanish cousin, “its flesh to be both delicate and delicious.”



THE GREAT INDIAN BUSTARD

Eupodotis edwardsi.

Genus EUPODOTIS.

This genus, which contains but one species occurring within our limits, the largest of our Indian Bustards, can be distinguished at a glance from any other by its large size, combined with its black-crested crown. The sexes are alike in plumage, but the male very greatly exceeds the female in size. The genus *Eupodotis* contains altogether four species, two African, one Indian, and one Australian, which, as I have already said, is very closely allied to the Indian.

EUPODOTIS EDWARDSI.

THE GREAT INDIAN BUSTARD.

Otis edwardsii, Gray in *Hardw. Ind. Zool.* i (1830); *Hume, S. F.* i, p. 227; *Adam, ibid.* p. 393; *id. ibid.* ii, p. 339.

Eupodotis edwardsii, Blyth, *Cat.* p. 258.

Eupodotis edwardsi, Jerdon, *B. of I.* iii, p. 607; *Stoliczka, J. A. S. B.* xli, p. 250; *Hume, Nests and Eggs*, p. 557; *id. S. F.* i, pp. 125, 237; *Butler, ibid.* iv, p. 9; *Ball, ibid.* p. 234; *Fairbanks, ibid.* pp. 262, 266; *Hume & Marsh. Game-B.* i, p. 7; *Davis & Wend, S. F.* vii, p. 87; *Ball, ibid.* p. 266; *Tweedie, ibid.* p. 528; *Hume, ibid.* viii, p. 111; *Wilson, ibid.* p. 490; *Butler, Cat. B. of S. etc.* p. 56; *id. Cat. B. of S. Bom. Pres.* p. 71; *Davidson, S. F.* x, p. 318; *Murray, Vert. Fauna Sind*, p. 217; *Barnes, B. of Bom.* p. 320; *Oates in Hume's N. & E.* 2nd Edit. iii, p. 375; *Blanf. Avifauna, B. I.* iv, p. 194; *Sharpe, Cat. B. M.* xxiii, p. 325; *id. Hand-L.* i, p. 176; *Oates, Cat. Eggs B. M.* ii, p. 90; *Oates, Game-B.* i, p. 399; *Barnes, J. B. N. H. S.* i, p. 57; *Rayment, ibid.* ix, p. 107; *Stuart Baker, ibid.* xxi, p. 303 (1912); *Simcox, ibid.* xxii, p. 201 (1913); *G. O. Allen, ibid.* xxvi, p. 633 (1919).

Vernacular Names. *Ghorar*, Kathiawar; *Tugdar*, Punjab; *Gurayin*, Hariana; *Sohum*, Gughunbher, *Hukna*, H., *Serailu*, H. (Nerbudda); *Bherar*, Saugor; *Hum*, Mahr; *Mardonk*, Maldhonk, *Karadhonk*, *Karlunk*, Deccan; *Tokdar* of Mahomedan Falconers; *Gurahna*, Sind; *Bat-Meka*, *Bat-myaka*, Tel.; *Batta-mekha*, Yanadi; *Gunad*, Pardi; *Kanal-Myle*, Tam.; *Heri-hukki*, *Arl-kujina-hukki*, *Yereladdu*, Can; *Dhoom chiriya*, Mirzapur.

Description. Adult Male.—Crown from bill to nape black with a certain amount of white stippling near the forehead and with the nape mixed black and white, remainder of head and neck white, pure in very old birds but faintly barred with brown or brownish black, more especially on the upper neck, in young birds. Back, rump and upper tail-coverts, together with scapulars, inner secondaries and lesser wing-coverts deep-buff, finely vermiculated with black; the median wing-coverts are dark greyish or brownish-black generally tipped with white, greater coverts deep-grey, edged black and tipped white; primaries dark-brown becoming more grey on the innermost; outer secondaries dark-grey, these and the primaries all tipped with white and the inner ones marked with a white band on the inner web. Under wing-coverts white; flanks dark grey; tail like the back but more grey and with a broad terminal band of blackish-brown, with the outermost one or two pairs of rectrices tipped white. A broad black band across the breast, often continuing right round to the hind-neck, where it divides the white of the neck from the buff of the back. Under tail-coverts and feathers round vent blackish-brown, marked with white and with white tips; thighs generally much marked with black and sometimes entirely black; rest of under-parts white.

Colours of Soft Parts.—"The legs and toes are generally yellowish-creamy, a little dingy on the toes; but I have noticed specimens in which the legs had more of a light fleshy tinge and others in which the pale yellow had a grey or plumbeous tinge; the irides vary from pale to bright yellow; the bill is greyish-brown to greyish-white, dusky at tip and near forehead, and often a little yellowish below." (*Hume.*)

Measurements.—"Length 45 to 50 inches, expanse 86 to 96, wing 24·5 to 29, tarsus 7·5 to 8·37, bill to gape 4·0 to 4·75, weight 17 to 22 lbs." (*Hume.*)

The middle toe averages about 2·95 inches in length.

The crest-feathers are about 2 inches in length.

Jerdon gives the weight as up to 28 lbs., but this weight is unusual. The heaviest I have received any record of is one shot by Major A. B. Burton of 26½ lbs., and Colonel L. L. Fenton gives the average weight of cocks as 21 lbs.

Blanford in 'Avifauna of British India' gives the weights of hens as 10 lbs. and of cocks as 25 lbs. to 35 lbs. and says that birds of

40 lbs. have been recorded. I cannot trace these records, and there may possibly be some mistake about them.

Adult Female.—The adult female only differs from the male in being very much smaller, in having the white of the head and neck less pure and more vermiculated with black bars, and in having the pectoral band absent or only faintly indicated except at the sides.

Measurements.—Length of wing 18 to 22 inches, tail 9 to 10, tarsus 6·20 to 6·50, middle toe about 2·5, bill, culmen 2·20 to 2·35, from gape 3·00 to 3·20.

Weight from 8 to 11 lbs., running up to 13 lbs., but sometimes heavier still, as Captain J. R. J. Tyrrell informs me that in December, 1905, he shot a female weighing between 14 and 15 lbs. not far from Dhar in the Bhopawar Agency, C.I., whilst Major Burton records three hens between 17 to 18 lbs.

The crest-feathers are not often as fully developed as in the male.

Young Male.—Resembles the female but with buff spots on the crown, hind-neck and upper back.

Nestling.—Covered with down, buff above with black marks on the head and upper back; below white or buffy-white.

Distribution.—The distribution of the Great Indian Bustard, which is not, of course, found outside Indian limits, is thus given by Blandford in the fourth volume of the 'Avifauna of British India.' The plains of the Punjab between the Indus and the Jumna, also Eastern Sind, Cutch, Kattyawar, Rajputana, Guzerat, the Bombay Deccan, the greater part of the Central Provinces, extending as far east as Sambalpur, the Hyderabad Territories, and parts of the Madras Presidency and the Mysore State as far south as Southern Mysore and perhaps further south. Stragglers may be found outside the area specified, as in Western Sind, Meerut and Oudh; but the Bustard is unknown in Behar, Chota Nagpur, Orissa and Bengal, on the Malabar Coast and in Ceylon.

Oates, in his 'Game-Birds' thus briefly describes its habitat:—

"It is found in the Punjab and less commonly in Sind. To the east it ranges as far as the Jumna and approximately up to a line, roughly speaking, connecting Delhi and Sambalpur in the Central Provinces. Southwards it is met with down to about the 11th degree of north latitude."

Captain K. L. W. Mackenzie, of the 62nd Punjabis, writes to me that he shot "one of a party of four hen Great Indian Bustard at a place called Meja in the Allahabad district, about half-way between Allahabad and Mirzapur. This is considerably further east than the limits laid down by Oates."

Mr. F. Field of the Opium Department also writes me :—

"I saw a specimen of this bird in the Shahabad District of Behar in the cold weather of 1888. I could not get near enough for a shot but it was undoubtedly this bird, as I watched him through my glasses.

"A specimen was shot by Mr. P. W. Stevens in the Gaza district in 1902 or 1903 and the skin given to me. He also said that he saw another in the same locality on another occasion."

In 'Stray Feathers,' Vol. iv., Mr. F. Wilson records the fact that a few Great Bustard are always to be found in Mazuffernugger during the cold weather, he, himself, having on one occasion seen a flock of sixteen. Mr. F. W. Butler in the same volume confirms this, and says that a few are to be found in the district throughout the year. He also states that "between the line of railway and the Ganges canal, from near Roorkee to, I believe, Ghaziabad there runs a broken range of sandhills. Along the tract right and left of the range the land is high and sandy, and here Bustards are to be found. I cannot positively assert that they extend into the Meerut district, but I believe such is the case; and certainly a bird is occasionally to be seen during the rains in the Saharanpur district, east of Deoband.

"In 1871 I was in the Mirzapur district. I was told by natives, and also, I think, by Mr. Pollock, C.S., that both Bustard and Florican were to be found some miles from the station, along the Great Deccan Road."

Fortunately, at all events as regards the Bustards, these grand birds are still to be found in this district and Mr. G. O. Allen thinks that they breed there.

I have several letters informing me that this fine Bustard is common in parts of Eastern Sind, and by no means rare in one or two favoured localities in Western Sind. In respect to Kathiawar Colonel L. L. Fenton writes: "It is found throughout the Province of Kathiawar in suitable localities, which means everywhere except the Gir Forest and the Barda Hills"; and he adds, "Malia on the

Gulf of Cutch, as well as Chotila on the old Rajkot-Wadhwan road are also good localities for them in the cold weather."

Very numerous letters from observers and sportsmen who have been good enough to report to me the result of their experiences, in some instances dating from the publication of Hume and Marshall's 'Game-Birds,' add nothing further to the area as given by Oates and Blanford. At the same time these letters are of extreme interest as showing that the Great Indian Bustard is in many parts of India most irregular in its movements, and that in other parts it is merely a seasonal visitor, either for the purpose of breeding or during the non-breeding season.

Writing of thirty years ago Colonel L. L. Fenton noticed this semi-migratory habit and speaks of its being specially plentiful in the neighbourhood of the Rajkot-Wadhwan road to the north-west of the Province in the cold weather and increasing greatly in numbers about Rajkot itself during the rains. Hume deals with this matter very briefly, and merely says: "It is to a great extent migratory, spending one season of the year in one part of the country, and moving to another to breed." Thus, for instance, in what used to be called Bhattiana, now the Sind district, it is extremely abundant during the rainy season, when it breeds; whereas, during the cold season, it is comparatively scarce. Further on (p. 12) Hume quotes Davidson to the following effect:—

"In Poona and Sholapur it is certainly a permanent resident, that is to say, that at all seasons a few may be found in all parts of the Collectorate. I think, however, that more breed in the district than are to be found there in February or March, and that birds come in, in the beginning of the rains, to breed, and leave when their young are able to fly."

Nidification.—As regards the breeding season of *Eupodotis edwardsi* it is not easy to lay down any very definite period. Hume says:—

"The Great Indian Bustard in Upper India lays mostly in July and August, but the breeding-season varies a good deal according to the rainfall, and we have found eggs as early as the first half of March, and as late as the first half of September. In Southern India, according to Jerdon, they lay during the cold season.

"The eggs are placed on the ground, at the base of some bush or tuft of grass in a small depression, generally unlined, often thinly

lined with a few straggling blades of grass. The situation varies; sometimes the nest is in an open waste, sparsely dotted with a few herbaceous shrubs, often in the stubble of the giant and bulrush millets, and still more often in clumps and patches of high thatching grass, or the dense soft lemon-grass so characteristic of the favourite haunts alike of this Bustard and the Houbara.

"My impression is, that the birds lay only one egg. But sometimes two eggs are found pretty close together, and either the females not unfrequently lay very close to each other, or when a female does lay more than one egg, she deposits the second some little distance from the first. Khan Nizam-ud-din Khan has taken more than a hundred of these eggs with his own hand, and he never found two eggs side by side. Where, as not unfrequently happens, two are within a yard or two of each other, he believes that they belong to different birds, and that this is a fact he has in one or two cases proved by snaring both females. I have only myself seen five nests, each containing a single egg. I can, therefore, say nothing positive on this subject.

"The eggs vary very much in size and shape. They are all more or less oval, but while some are moderately broad and slightly pointed at one end, others are long ovals, exactly similar at both ends, and others again are long and cylindrical, of the same size and shape as the egg of the great Northern Diver figured by Mr. Hewitson; and I have one specimen that, both in colour, shape and size, might have been the one from which his plate of the egg of the European Bustard was taken. The shells are very thick and strong, closely resembling those of the Sarus in texture, and like those of this latter species, the eggs very commonly exhibit pimples and rugosities at the large end, so much so that, out of sixty eggs now before me, only seven are perfectly free from such imperfections. Some of the eggs are dull and with little gloss, the whole surface being closely pitted with small pores similar to, but fewer than, those in the Peafowl's egg, while other specimens are brilliantly glossy. The ground-colour varies much. Typically it is a sort of drab colour, but it is often earthy-brown, dingy olive-green, pale olive-brown, pale reddish-brown, and, although rarely, even pale leaden-blue. The markings vary in extent, number and intensity; sometimes they are pretty deep reddish-brown and clearly-marked blotches, but more usually they are pale reddish-brown clouds and streaks, sometimes so faint as to be mere mottlings, and sometimes, though rarely, altogether wanting. Occasionally, the markings form an irregular blotchy cap at the large end.

"Out of sixty eggs in my collection, no two are precisely alike. In length they vary from 2'75 to 3'42 inches and in breadth from 2'05 to 2'45, but the average of sixty eggs is 3'11 $\times$ 2'24."

Hume's eggs, now in the British Museum, show a most beautiful range of colouration, far in excess of what one would expect from the above description, and many may have been taken after it was written.

The most normal colour is an olive-brown, in some eggs more brown, in others more olive, whilst in some there is a distinct yellowish tinge, and in a good many a grey or greyish-stone tint. The markings consist of indistinct blotches and freckles of dull-brown, livid-brown, or reddish-brown with, more rarely, others of neutral tint or grey. As a rule, both types of marking are longitudinal in character and very sparse, in some eggs being almost entirely absent or so faint as to be indiscernible without close inspection.

The abnormal-coloured eggs are generally pale blue-grey or very pale blue-green in ground-colour, and are probably the result of imperfect colouring in the oviduct due to exhaustion of some of the colour-ducts or to illness of the bird laying them. They are exactly similar to the last-laid eggs of gulls and terns, whose eggs have previously been repeatedly taken or destroyed. Four or five of Hume's eggs of this bustard are practically uni-coloured pale-yellow, or grey-stone, and there are two light yellow-brown eggs which are quite handsomely blotched with reddish-brown and underlying marks of neutral tint.

One or two eggs are marked with specks and spots rather than blotches, and one of the blue eggs has a few well-developed blotches of dark rich brown.

The shape of the egg is very regular, almost an ellipse, with one end a little smaller than the other; here and there one sees an egg which is a very broad oval, and even less often a long narrow oval.

The surface is very fine and smooth, and there is a decided gloss in the majority of eggs, though a few have none at all.

The longest egg in the Hume collection measures 86.3×53.2 mm., whilst the shortest is 68.0×55.5 mm. The broadest measures 80.5×61.3 mm., and the most narrow 82.5×53.5 mm. The average of eighty-three eggs is 79.4×57.6 mm.

I have in my collection a very fine series of eggs of this species taken by Mr. Harrington Bulkley, and the times at which these eggs were found extend considerably the period given, as above, by Hume.

The majority were taken in August and September, but many were taken in October and one in November. On the other hand, I have three Deccan eggs taken in June and an egg from Cutch taken in January. Then I have records of eggs from Poona in April; Sholapur, April and May; and Guzerat, June and November. I have, therefore, eggs actually in my collection, or authentic records of eggs, taken in every month of the year except December, February, and March. I think we may say that, very roughly speaking, the Great Indian Bustard breeds principally from August to November, but that many birds breed earlier and later than this, and that the breeding-season varies very much in different localities, these not necessarily very far apart.

As to the number of eggs laid there is little to add to what Hume has noted. Undoubtedly the number normally laid is only one, and the exception to this rule is of the rarest. I have, however, in my collection one pair of eggs which are said to be from the same bird, but even here I must record the fact that they were found about a foot apart, in the same small beaten-down patch in a field of lemon-grass. The two eggs are of the rich-brown variety, and are so exactly like one another in every detail that it seems probable that they are a pair.

My eggs, a much smaller series than Hume's, have a rather smaller range of variation in colour; although Mr. Harrington Bulkley's series represents the variations picked out of a very much greater number which passed through his hands. Hume calls his eggs in ground-colour *typically* a drab; I should call mine *typically* dull pale reddish-brown; certainly in five out of six brown is the dominant colour of the egg. I have one egg which is a uni-coloured sienna-brown, and it is only when held up to the light that the very faint markings can be seen. Many eggs are a stone-grey or drab in general appearance, others are a yellowish stone-colour or olive-yellow, a few dingy olive-green, and one a beautiful pale sea-green. The markings are similar to those in the Hume series, but I have none which could be said to be boldly marked.

The majority are very highly glossed, and very few have no gloss at all. My longest egg is 3.71 inches (= 94.2 mm.), and my broadest 2.35 (= 59.7 mm.), whilst the shortest and most narrow are

respectively 3.0 (= 76.2 mm.) and 2.11 (= 53.6 mm.), and the average of 45 measured is 3.21×2.29 (= 81.5×58.1 mm.), my eggs therefore averaging considerably larger than Hume's.

General Habits.—The Great Indian Bustard usually associates in small flocks. In the cold weather two or three cocks or two or three hens may be seen keeping one another company, but in the breeding-season the parties consist, as a rule, of an old cock-bird with his harem of two to six or more wives. Sometimes, however, they collect in large droves. Jerdon says: "I have seen flocks of twenty-five or more, and a writer in the 'Sporting Review' mentions having seen about thirty on one small hill." Mr. E. James also records that on one occasion he counted more than thirty birds in a flock, and Mr. S. Doig found no less than thirty-four birds feeding together in one *Jamba* field. Such flocks as these must, however, be but rare, though droves of eight or ten and upwards are often met with. Major A. B. Burton informs me that an officer in the Hyderabad Contingent came across seventeen birds together in the Raidan Doab, and Major R. W. Burton once saw nineteen birds at Tuggali, on the S.M. Railway, east of Guntakul, though on the latter occasion the birds appear to have formed two flocks, one of six and one of thirteen. Numerous other correspondents have met with flocks of ten or twelve. On the other hand, solitary birds are constantly met with at all times of the year; in the cold season, especially, the birds seem to be often seen singly, but even during the rainy season and breeding-season cock-birds are often seen alone. These are probably suffering from compulsory isolation, not having been able to attract any females and unable to forcibly attach the harem of any other male. Sometimes two or three such young males may be seen together in the breeding-season, seemingly sympathizing with one another for the absence of female society.

There is still no general description of the habits of the Great Indian Bustard better than that of Jerdon as quoted by Hume and others. He writes:—

"The Bustard frequents bare open plains, grassy plains interspersed with low bushes, and occasionally high grass runnahs. In the rainy season large numbers may be seen together stalking over the undulating plains of the Deccan or Central India. I have seen flocks of twenty-five or more, and a writer in the 'Sporting Review'

mentions having seen above thirty on one small hill. This writer states his belief that they are never seen in any district that is not characterized by hills as well as plains; but this, from my own experience, I would merely interpret that they do not frequent alluvial plains, but prefer the undulating country; for I have seen them on extensive plains, where there were merely a few ridges or eminences, and nothing deserving the name of a hill close at hand. Towards the close of the rains, and in the cold weather before the long grass is cut down, the Bustard will often be found, at all events in the heat of the day, concealed in the grass, but not for the purpose of eating the seeds of the Roussa grass, as the writer above alluded to imagines, rather for the large grasshoppers that abound so there, and which fly against you at every few steps you take. During the cold weather the Bustard frequently feeds, and rests during the day likewise, in wheat-fields. When the grass and corn is cut, and the bare plains no longer afford food to the Bustard, it will be found along the banks of rivers where there is long grass mixed with bushes, or the edges of large tanks, or low jungle where there is moderately high grass, or it wanders to some district where there is more grass, for though they do not migrate, yet Bustards change their ground much according to the season, and the supply of grasshoppers and other insects. The hen birds, remarks the writer quoted above, generally congregate together during the rains, are very timid, and frequently, when a sportsman is pursuing a single one, she will attempt to seek safety, fatally for herself, in some large bush, particularly if the gunner turn aside his head, and affects not to see her at the moment of hiding. The cock-birds at this season feed a mile or so apart from the hens, and stretching their magnificent white necks, stride along most pompously. Besides grasshoppers, which may be said to be their favourite food, the Bustard will eat any other large insect, more especially *Mylabris*, or blistering beetle, so abundant during the rains; the large *Buprestis*, *Scarabæi*, caterpillars, &c., also lizards, centipedes, small snakes, &c. Mr. Elliott found a quail's egg entire in the stomach of one, and they will often swallow pebbles or any glittering object that attracts them. I took several portions of a brass ornament, the size of a No. 16 bullet, out of the stomach of one Bustard. In default of insect food, it will eat fruit of various kinds, especially the fruit of the Byr (*Zizyphus jujuba*) and Caronda (*Carissa carandas*), grain, and other seeds and vegetable shoots.

"The Bustard is polygamous, and at the breeding-season, which varies very greatly according to the district, from October to March, the male struts about on some eminence puffing out the feathers of his neck and throat, expanding his tail, and ruffling his wings, uttering now and then a low, deep moaning call heard a great way

off. The female lays one or two eggs of a dark olive-green, faintly blotched with dusky. I have killed the young, half-grown, in March near Saugor.

"The Bustard has another call heard not unfrequently, compared by some to a bark or a bellow, chiefly heard, however, when the bird is alarmed. This is compared by the natives to the word *hook*, hence the name of *hookna*, by which it is known to the villagers about Gwalior. When raised, it generally takes a long flight, sometimes three or four miles, with a steady, continued flapping of its wings, at no great distance from the ground, and I never found that it had any difficulty in rising, not even requiring to run one step, as I have many times had occasion to observe when flushing them in long grass or wheat-fields. On the open bare plains, it will sometimes run a step or two before mounting in the air. A writer in the 'Bengal Sporting Magazine' asserts that he has known the Bustard ridden down, and that after two or three flights it is so exhausted as to allow of its capture. I imagine that a healthy bird would tire out the best horse and rider before giving in."

Referring to Jerdon's remarks on the "showing off" of the male bird at the commencement of the breeding-season, Hume remarks:—

"The way in which the male expands the throat at times during the breeding-season is most extraordinary. Twice I have closely watched the whole process through binoculars. First the male begins to strut about, holding his head up as high as if he wanted to lift himself off his legs; then after a few turns, he puffs out the upper part of the throat just under the jaws, then draws it in again, then puffs it out again, and so on, two, three or four times, and then, suddenly, out goes the whole throat down to the breast, and that part of it next the latter swells more and more; his tail, already cocked, begins to turn right back, over the back, and the lower throat bag gets bigger and bigger, and longer and longer, till it looks to be within six inches of the ground. All the feathers of the throat stand out, and looked at in front, he seems to have a huge bag covered with feathers hanging down between his legs, which wobbles about as he struts here and there with wings partly unclosed, and occasional sharp snappings of his bill. From time to time he utters a sort of deep moan, and stands quite still, and then off he struts again close up to the female, and then away from her. On both occasions that I witnessed these antics, the excitement seemed gradually to relax, and no connubialities resulted. Whether this is usually a prelude to such, or a mere nautch for the edification of the female, like the peacock's grand display, I cannot tell, but I am inclined to believe the latter."

It will be seen from Jerdon's description, which I have above quoted, that the Bustard is capable, when necessary, of rising straight from the ground into full flight, at the same time there is little doubt that our Indian bird, like the European Great Bustard, prefers to run a few steps before springing into flight, though the facility with which it does this is a matter of opinion. Thus Captain A. H. Mosse writes: "The big Bustard is very slow in rising, and has to take four or five steps with outstretched wings before he succeeds in getting up into the air." Captain C. Brownlow, on the other hand, writes: "before rising from the ground, they ran only a few steps and rose with apparent ease." When once flushed, it flies well and strongly, though with but slow beats of the wing, and at a very much faster rate than those who have not shot at it would give it credit for. Those who have shot these fine birds soon find, however, that they fly quite as fast as smaller birds which appear to go at twice the pace and it is necessary to shoot well forward to bring them down.

In addition to the moaning call and the bark or bellow described by Jerdon, Capt. C. Brownlow mentions a third sound made by these birds. He writes to me about this as follows :—

"I then saw a flock of six or seven feeding near a small village and managed to get within some thirty yards or so before they became alarmed and flew off. Whilst moving about before they were disturbed they kept up a sort of crackle."

The Bustard is a difficult bird to circumvent, affording as good sport as any game-bird known, and calling forth all the cunning and patience of the sportsman.

Of course, there are occasions on which the bird's natural cuteness fails to keep it in its ordinary advantageous position in the open and the quantity of food obtainable in high crops sometimes entices it to its doom. Thus, as Mr. J. E. James records in 'Game-Birds,' "the largest bag I ever knew was made near Malegaon, in the Nasik district, when an officer came upon a flock feeding in a field of jowari which was above their heads. He walked them up and shot eight of them as they rose, like so many partridges."

So, also, Capt. Mosse remarks :—

"Occasionally the Indian Bustard may, I believe, be put up out of crops like a quail and bagged at short range. But my knowledge of him is confined to the open plains where he is ordinarily met with in these parts. He may be shot in two ways. First by stalking him with a small-bore rifle, though stalking is hardly the correct term, owing to the absence of cover, which necessitates a perfectly open approach. If this be conducted with an air of indifference and by an indirect advance, a shot may often be obtained at from 80 to 100 yards. A nearer approach is rarely possible unless there is some slight cover, grass, or low bushes (for the bird I mean). In that case the Bustard will sometimes squat down flat, vanishing from sight in a marvellous manner, but unable to resist the temptation of now and then raising its head to see where you are. Now is the chance for the shot-gun. Gradually lessen the distance by from ten to twenty yards, then turn and run straight in, when, with any luck, you may be able to get in both barrels at a fair range."

Mr. G. Sanderson, also, was apparently more fortunate than most sportsmen in inducing Bustard to wait for him in scrub-jungle until he could get within shot. He says, *vide* Hume:—

"The great Indian Bustard occurs somewhat plentifully throughout Mysore, in suitable localities, viz., open plains in the vicinity of scrub-jungle. I have seen five feeding together, three commonly. I believe that the Bustard in Mysore migrates. It is exceedingly wary. Its note, usually uttered before daylight, is a booming cry, not unlike a distant shout; hence it is denominated in Canarese the 'bird that calls like a man' (Arl-Koogina-Hukki).

"The Bustard feeds in stubble-fields and open plains till about 10 a.m., as also in the afternoon. During the heat of the day it retires to low bush jungle. I have frequently shot Bustards by having markers posted upon commanding eminences within a circuit of three or four miles round their feeding-grounds. The particular habits of the birds are generally well known locally, and when one has been marked down after its return from its morning feed, it may generally be walked up, within a few hundred yards of the place where it alighted. In the scrub-jungle they frequently lie very close, and must be carefully looked for. Before I was aware of this peculiarity, I failed to find several birds. On one occasion a Bustard uttered its peculiar cry about twenty yards behind me. It had walked out of a small bush which I had passed within five yards, and uttered its note when standing on the ground."

Similar examples of a confiding disposition in the Indian Great Bustard must not, however, be *expected*, though they may be *hoped*

for, by the man who wishes to bring it to bag. It will be wiser on his part to start with the conviction that he will have to use patience, perseverance and brains before he can pat himself on the back as being a wiser bird than the one he is after.

Driving, such as is so often successfully carried out in the pursuit of the European Bustard, is not often resorted to in India, and the destruction of our Indian birds is more often accomplished by stalking and the aid of a small-bore rifle. Even this, however, is but seldom possible in the truest sense of the word, for the bareness of the country in which the game is found and the general complete absence of all real hills or elevations prevent any easy approach under cover.

In the 'Indian Field,' 1904, Major R. W. Burton gave an interesting account of a stalk which ended in success. After some preliminary remarks, he says:—

"At last the white neck of the cock Bustard caught my eye some 600 yards away, and in a few moments, with the aid of field-glasses, three others were distinguished not far from the first and all were busy feeding. It was most interesting to watch them stalking about in the stately way they have.

"Bustard have a keen sense of smell, and as any approach except down wind appeared impossible, there was nothing for it but to wait. In the course of half an hour the birds were tending towards some higher ground on which were a few small bushes. A *détour* under cover of a fold in the ground took me, without any particular precaution, to within 150 yards of these, and a crawl on hands and knees and elbows, and sometimes on the stomach—all through sopping wet plough-land—took me some 80 yards nearer. Sitting slowly up to see where my friends were, I saw a long white neck appear round one side of a bush, about 120 yards away, peering this way and that to see what strange green and brown beast it could be sitting in the field (my shooting suit was of the greenish-brown heather mixture, and much bespattered with mud). I sat like a carved image, as the least movement would be fatal, and that curious bird actually paced slowly on until 70 yards away without being able to make me out. Opportunity was taken as the bird paused for a moment behind a small bush, with long tufts of grass growing through it, to get the little '310 rifle to bear in his direction with elbows on knees ready to fire. At last discovery appeared imminent, so taking careful aim at the lower edge of the breast I dropped him with a shot through the body. Loud hoarse grunts of alarm showed

me the other birds were not far off, and on my standing up the last of them flew off from some 150 yards away.

"There is no finer bird than a male of the Great Indian Bustard, and the delight in handling the magnificent plumage was mingled with a genuine feeling of regret—now the excitement was over—that the stately bird would no more proudly stalk his native plains."

In writing to me he adds that on another occasion he combined a stalk and a drive with great success.

"It was with reliable information of the Bustard being in considerable numbers that Major H. Greany, I.M.S., and myself took the train for the small wayside station of Tugalli, in January, 1896. Within half a mile of the station we discovered six birds feeding among some stunted babul bushes and arranged for one of us to stalk and the other to lie up on the chance of getting a shot as the birds flew on. The stalk fell to my share and resulted in a successful right and left with S.S.G. at 60 and 90 yards rise, the other birds going straight over the Doctor, who dropped one bird with S.S.G. from his right barrel and merely staggered another bird, as he had loaded the left barrel with No. 6 shot, being afraid to fire S.S.G. from the choke barrel of his best 'Alexander Henry!'; the wounded bird carried on until out of sight, and we did not succeed in finding him. The three birds secured were all hens and weighed 17 lbs. to 18 lbs. each."

Another correspondent, who desires to remain unnamed, sends me a very interesting account of a two days' stalk after Bustard, which shows that success does not always attend even the hardest worker under the most advantageous circumstances. He writes:—

"The Great Bustard has always been an object of admiration to me, and I have spent many long days after him, sometimes with the success that makes a man feel above himself for days together, but more often, I must admit, with the failure that makes a man feel his smartness to be great depths below the bird he is after.

"In April, 1902, I had the good fortune to be stationed at . . . an ideal place for Bustard in every way. Birds were remarkably plentiful, and though the ground was mostly very bare, it was rolling and even hilly in places, so that by taking advantage of the rises and dips, and by making use of the tufts of grass, an odd ber-bush or so, or of stones and rocks larger than usual, one could often carry out a genuine and successful stalk.

"Starting early in the morning, indeed, almost before it was light, I was soon on my shooting-ground, but even at that time the

heat was intense and already there was that shimmer in the atmosphere which foretold the greater heat to come. Lying flat on the top of a stony ridge, the highest point in the neighbourhood, I brought my binoculars to bear on the various points of the horizon, and was rewarded by seeing no less than three lots of Bustard, one consisting of eight birds, one of four, and a third of two grand old cock birds. The fewer eyes to watch me, the greater the chance of getting close, so I decided to first try for these last two birds. They were a long way off, nearly a mile, so that for the first few hundred yards no very great precaution was necessary; moreover there was a crack in the ground—one could hardly call it a water-course—which led in the right direction for my stalk, and by stooping low I could make use of this for a good quarter of a mile without much chance of being seen. Before making a start I located the birds as being about half-way between two stunted ber-bushes about 100 yards apart, and as these bushes were some two or three feet higher than the heads of the Bustard, they served as admirable marks which I could keep in view without the risk of trying to see the Bustard themselves. Down the water-course I went with success until I arrived at a place where it was too shallow to allow of my going any further except on all fours. Here, I wanted a further look for my game, so getting behind a tuft of grass, I gradually raised my head—covered with a helmet of the same colour as the stones which lay scattered in every direction—until I could peer between the withered stems. Both birds were still in the same place and were engaged in the most curious antics, bowing and scraping to one another, although there were no hens visible within miles of them. Directly between myself and the Bustards the ground was quite bare, but a little to my left, and some two or three hundred yards nearer, there were a few bushes, and further on again were others I hoped to be able to make use of. Working my way on hands and knees up the rain-track, I got directly in line with the bushes, and after I had wiped the streaming perspiration from my eyes, continued, still on hands and knees, until I got behind their shelter. Arrived here, I found I had to make my way in full view of the Bustards—now about 600 yards away—before I could get under cover of a big stone, whence I could again make my way to another clump of bushes. Down I went on my waistcoat and, yard by yard, covered fifty yards of open, halting for a few seconds whenever the birds looked my way. At last I got behind the stone and had a rest before recommencing another series of painful crawls which were to take me to within shooting distance of my game. The two ber-trees showed up well and kept me on what I believed to be the correct line, and eventually I stopped under the shelter of a couple of bushes and some tufts of grass, which I had estimated

to be within about 100 yards of the Bustard and within easy range for my little rifle. Having rested until my heavy breathing ceased I knelt up, and having mopped my face and brought my rifle to full cock, peered out. No birds! Kneeling up a little higher I looked further afield and then saw them strutting along some 200 yards beyond where they had been when first seen. Unfortunately, at the same moment one of them caught sight of me and after a second's hesitation ran a step or two and then launched on his wide pinions, to be immediately followed by his companion.

"It was, however, still early, so waiting for my man to come up with my flask, I had a good drink, and then once more we searched round the horizon for more birds. There they were, a flock of eight, probably the same I had seen in the morning, though they had wandered some distance since then. They appeared to be in an excellent position, from my point of view, for a stalk, just this side of a small rise which would keep them entirely out of sight until I should arrive within 50 or 60 yards of them. I accordingly got up and sauntered quietly away in the opposite direction and so round for well over a couple of miles in a semi-circle until I had got the hillock between myself and them. I then walked about a quarter of a mile in their direction, stooping lower and lower as the ground began to rise, until once more I was forced to go on hands and knees. In this way I got to within 300 yards of the top and was lying flat for a moment or two to recover my breath, when, without any warning, two of the Bustards suddenly appeared over the crest of the hill coming straight towards me. I lay absolutely motionless, but it was useless. First one bird and then the other stopped, stretched out his head and neck, put it on one side so as to get a better focus, for a moment or two seemed to doubt whether I was a dangerous object or not, and then, determining that I was, they both took to flight accompanied by the remaining six birds on the far side of the hill.

"The sun was now high up and the heat intense, so I made for the shade of some village trees, a weary two miles off, and there I fed, drank, slept and read for the next four hours. After the rest we again set forth, and it was not long before we again came upon some birds, two fine cocks, probably the same two I had tried for in the morning. The ground was favourable for a stalk, and after a repetition of the morning's work on hands and knees, ending with a crawl on my stomach for the last hundred yards or so, I got within 120 paces of the nearest cock. My only cover was a few scattered clumps of coarse grass, two or three feet high, so that I could not sit up to fire, but, resting on my elbows, had to fire as I lay. Alas! the report of my rifle only resulted in both birds springing into flight and sailing away unhurt, though followed by another bullet, fired in despair.

"No further opportunities to miss or hit occurred, and at dusk I made my way home a disappointed man.

"My next day's work was as unsuccessful as that already reported; practically all day I was within sight of Bustard, but it seemed impossible to work within shot. Once early in the morning I had stalked a solitary bird with success and had only a few more yards to cover when he took it into his head to change quarters and join a scattered flock nearly the opposite side of the plain. A stalk of this flock followed and I was again just congratulating myself on success when I blundered on a hen Bustard that was squatted in some ber-bushes not twenty yards from me. Of course, off she went, followed by the rest of the flock, which I did not again see that day. Two other stalks proved failures. In the first I could not get within 300 yards of my birds, and in the second I could only get just within that distance, and a shot, though it raked the feathers off the back of what seemed the largest cock, did no real harm.

"The following year I was again in the same place in February and managed to bag five fine cocks in one day, though I must confess that one bird was a fluke. I had had the usual painful crawl after a flock and eventually got to within sixty yards of the nearest bird, which I shot through the body, and then, to my delight, saw another bird, not by any means in a direct line with it, and some four or five paces distant, fall struggling to the ground. When I went up to them the first bird was dead, but the second was—as I afterwards found—only shot through the shoulder of the wing, quite incapacitated from flying, but as I feared, fully able to escape by running. Running away, however, was one of the last things it appeared to think of, and when I came close up to it, it assumed a most truculent air and actually advanced, beating its unwounded wing noisily up and down, uttering its deep cry at quick intervals. There was no stick within miles of me, so *faute de mieux* I was obliged to put another shot into it.

"On the same day I had another most unusual bit of luck, getting again two birds out of one flock. I had had my first shot and dropped my bird at about 100 yards' distance when the others, instead of at once taking to flight, actually paused long enough for me to get a second successful shot. My fifth bird was got in the middle of the day as we were returning to our starting point, for we came suddenly on it over the crest of a hill, and as its back was towards us I was enabled to drop down and crawl up the hill and then kill it with an easy shot at less than forty yards."

It is probable that this Bustard is not as common now as it used to be some fifty years ago when Jerdon wrote his 'Birds of India,' for I doubt if it would be possible for any sportsman to emulate the

gentleman mentioned therein who "killed above one thousand Bustards with his rifle." At the same time we must remember that those were the days when tigers averaged twelve feet, and it was a poor shot who could not get his brace or two before *chota hazri*.

Its area of habitat as given by Jerdon is much the same now as it was then, and such notes as I have had sent me show that its numbers have not changed much in any particular place during the last twenty-five years. Thus in 1879 Hume quotes Mr. G. Vidal as saying, "This species is found very sparingly in the eastern districts of the Poona and Satara Zillas." He then goes on to say that he only saw three specimens in five years in Satara, but that in Poona there are two or three places where it may be found yearly. After this Hume quotes Davidson as reporting it to be becoming yearly rarer in these parts, so that having been so scarce fifty years ago we should now expect it to be exterminated; yet Lieut. E. G. Phythian Adams, of the 80th Infantry, writing in May, 1910, informs me he knows "of its existence in the following districts: Satara, Poona, Sholapur, where it is uncommon."

Colonel L. L. Fenton, I should note, says that "some thirty years ago Bustard were fairly common in the Sholapur district, where they used to breed. I have also shot them in the Rabinnur Taluka of the Dharwar district. A few I also came across in the Kaladgi, now Bijapur, district."

Mr. J. E. James reported it as common in Hume's time in Khandedish and Nasik, and all my correspondents in that part of India say that it is so still.

From the Deccan reports are conflicting, but my correspondents who have gone most carefully into the matter tell me that the number of birds differs greatly in different years, and one writer adds that it is quite possible for a sportsman who does not know the district to be there a year and leave with the impression that the Bustard is but a rare straggler therein, whereas the man who has lived some years in the Deccan and knows exactly when and where to look for these grand birds may consider them almost common.

On the whole, therefore, we may hope that our finest Indian game-bird is not on its way to extinction, and that its wariness, combined with its open habitat, may enable it to survive any persecution

it has, or may have, to endure. At the same time the Great Indian Bustard requires protection just as much as our other game-birds do, for it is much sought after by snarers and bird-catchers. I have had several letters from correspondents describing the way in which these birds are noosed in all districts and all provinces. The principal way in which they are caught is thus described by Hume :—

“ In parts of the Punjab, and doubtless elsewhere, the native fowlers are very expert in noosing them. A small party is descried in the middle of a plain. The fowler, with a blanket folded over head and shoulders, native-fashion (or at times driving a trained bullock before him) and a large supply of pegs and gut nooses at his girdle, circles, slowly approaching nearer and nearer, round the flock. By little indications inappreciable to us, he discovers the direction in which if slightly and cautiously pressed, the Bustards will walk. Across the line of march, sauntering slowly backwards and forwards, and pretending to cut and collect grass the while, the fowler pegs down rows of nooses. Then, taking a wider circuit, he begins to approach the flock from the opposite side, not walking at them, but sideways, at right angles to the line he wishes them to take, passing nearer and nearer at each lap, never in the least alarming them, but quietly edging and pressing them towards the nooses. Sometimes he lets them walk right on to the nooses; generally, when close to them, he drops his blanket, throws up his arms, and rushes at them. They always in these cases run a few paces before they rise, and though occasionally all escape, generally one, often two, and sometimes three or four, are caught by one or other leg. The chief skill consists in walking them exactly across the lines of nooses, which are never, according to my experience, more than fifty yards long, and usually much less.”

Mr. Simcox gives another account of the catching of these birds which is worth quoting.

“ The hen Bustard is very devoted to her egg or newly hatched chick. The Bhils set out and find an egg or a newly-hatched chick, and the mother is never far off. They make a circular ring of dry grass and sticks round the egg or chick and set it on fire. The old bird sees this, comes up and tries to beat out the fire with her wings, the Bhils being in hiding. She may or she may not beat out the fire, but anyhow she singes her wings and cannot fly. The Bhils then run her down.”

As will be seen by Jerdon's description this bird is practically omnivorous; but to the items of diet mentioned by him must be

added rats, mice and similar animals, young birds and much vegetable matter, such as the shoots of young mustard, young wheat, lemon-grass, etc.

Two or three of my correspondents have mentioned this Bustard's curious taste for snakes, and the natives generally give it credit for being a constant slayer and devourer of those reptiles.

Our plate of *Eupodotis edwardsi* is an excellent one, but the colouration of the back in both male and female is too red and should be more of a sandy-buff. It must also be noted that the white eyebrow, as shown in the female, is not a sex-difference, but only an individual characteristic.

Genus CHLAMYDOTIS.

In the species of the genus *Chlamydotis* the sexes are alike, the female differing only from the male in being slightly smaller. It is distinguished from all other *Otididæ* by the presence of a curious crest which consists, not of a collection of feathers, either few or numerous, massed together, but of numerous isolated feathers, thinly-webbed at the base and completely separated and independent of each other. There is a thick ruff of black and white feathers on either side of the neck, and the feathers of the lower neck are also lengthened.

The genus contains but one species, *Chlamydotis undulata*, of which one sub-species, *C.u. macqueenii*, inhabits Central Asia and visits India in the cold weather.

CHLAMYDOTIS UNDULATA MACQUEENII.

MACQUEEN'S BUSTARD OR HOUBARA.

Otis macqueenii, Gray & Hardw. Ind. Zool. ii, p. 47 (1834); Hutton, J. A. S. B. xvi, p. 786; Blyth, Cat. p. 258; Gould, B. of Asia, vii, pl. 58; Hume, Ibis, 1868, p. 241; Blanford, East Pers. ii, p. 287; Heath, J. B. N. H. S. vi, p. 372.

Houbara macqueenii, Jerdon, B. of Ind. iii, p. 612; Stoliczka, J. A. S. B. xli, p. 258; Hume, S. F. i, p. 227; Adam, *ibid.* p. 393; Le Mes, *ibid.* iii, p. 379; Butler, *ibid.* iv, p. 9; Hume, *ibid.* p. 9; Butler, *ibid.* v, p. 231; Hume & Marsh. Game-B. i, p. 17; Hume, Str. Feath. vii, p. 67; *id.* *ibid.* viii, p. 3; Butler, Cat. B. of Sind, p. 56; Hume, Cat. No. 837; Doig, S. F. ix, p. 281; Murray, Vert. Faun. Sind, p. 218; Barnes, J. B. N. H. S. vi, p. 12; *id.* B. of Bom. p. 321; Sharpe, Cat. B. M. xxiii, p. 318; Blanford, Avifauna B. I. iv, p. 197; Sharpe, Hand-L. i, p. 175; Oates, Cat. Eggs B. M. i, p. 89; Finn, In. Waders, p. 122; Oates, Game-B. I. i, p. 405; Stuart Baker, J. B. N. H. S. xxi, p. 325 (1912); Delmé-Radcliffe, *ibid.* xxiv, p. 162 (1915); Currie, *ibid.* p. 574 (1916); Tomlinson, *ibid.* p. 828 (1916); Ludlow, *ibid.* xxv, p. 304 (1917); Thornhill, *ibid.* p. 487 (1918).

Eupodotis macqueenii, Gray, Hand-L. B. iii, p. 9.



MACQUEEN'S BUSTARD or HOUBARA.

female

Chlamydotis undulata macqueeni.

$\frac{1}{2}$ life-size

male.

Vernacular Names. *Tilur*, Punjab; *Talur*, Sindhi; *Hobara* or *Obara*, Persian.

Description. **Adult Male.**—Forehead, sides of the crown and whole upper plumage sandy-buff, very finely vermiculated with black, the general aspect being sandy; on the mantle and scapulars the black vermiculations form into fairly definite black bars across the feathers, but these are absent on the lower back and rump; crest of long narrow feathers, white on the basal and black on the terminal halves; upper tail-coverts like the mantle but more rufous. Tail sandy-rufous, the vermiculations almost absent at the base but increasing towards the tip, where they are as numerous as on the back and a little coarser; four broad bars of grey, the two apical bars darker, and becoming quite black on the two central rectrices, similar in character to the black vermiculated bars on the back; all the rectrices, with the exception of the two central ones, tipped white.

The feathers on the nape are curiously downy, and those in the centre are often without any vermiculations. Sides of the head whitish-buff with black striæ; chin and throat buffy-white; fore neck pale buff, finely vermiculated with black; on the upper breast the buff changes to a beautiful french-grey and the vermiculations almost disappear; lower tail-coverts buffy-white, much splashed and marked with brown, this colour forming into well-marked bars on the outer webs of the outermost feathers; remainder of lower parts white. Primaries black, the bases white and the outer webs buff, this colour being most pronounced on the first primary, the inner webs white for two-thirds of their length, outer secondaries the same but with no buff on the outer webs and with the tips white; inner secondaries like the scapulars; lesser wing-coverts like the back, median coverts the same but albescent; greater coverts with broad black subterminal bars and white tips; winglet black.

Both males and females have a ruff of feathers starting from the sides of the neck and, to some extent, from the hind-neck; the latter are sparse and thin, mixed black and white but with the former predominating; the feathers at the sides form two long tufts, the inner are white on the basal halves and black on the terminal halves, which are much broader; outside these the feathers are white, of the same breadth throughout and generally longer than the broader

black feathers : here and there may be seen a few faint bars of grey or specks of black. The feathers of the sides of the breast are very full and long, forming a continuation of the ruff.

The feathers of the crest may measure as much as 81·2 mm. in length, whilst the longer feathers of the ruff are sometimes well over 177·8 mm., and those of the breast are up to, or even over 76·2 mm.

In old birds the grey on the breast appears to become purer and more extensive, whilst the vermiculations become fewer and fewer.

Colours of Soft Parts.—"The irides vary from pale to bright yellow.

"The legs and feet are pale-yellow, never clear and bright, mostly with a dingy, or greenish, or plumbeous tinge, at times creamy; the bill is blackish or dusky above, paler, usually greenish or yellowish on gape and lower mandible.

Measurements.—"Length 28 to 30·25 inches, expanse 51·5 to 57·75, wing 15 to 16·1, tail from vent 8·5 to 10·25, tarsus 3·4 to 3·9, bill from gape 2·3 to 2·4. Weight 4 to 5¼ lbs." (*Hume*).

The measurements of the few males I have measured have been as follows: wing 14·3 to 16·2 inches (= 36·3 to 41·1 mm.), tail 8·5 to 9·5 (= 216 to 241 mm.), bill, culmen 1·35 to 1·5 (= 34·3 to 3·81 mm.), and from gape 2·1 to 2·35 (= 53·3 to 64·7 mm.), mid-toe 1·65 to 2·0 (= 41·9 to 50·8 mm.).

Sharpe gives the measurements as "total length about 28 inches, culmen 1·8, wing 15·7, tail 9·5, tarsus 4·9." These measurements are very curious, as he makes out the female to be a much smaller bird, yet gives a longer wing-measurement for the female than for the male. The measurement given for the tarsus, 4·9, is probably a slip or misprint for 3·9 inches.

Adult Female.—"Differs from the male in being very much smaller and in having the crest and the ruff of the neck more feebly developed, the freckling on the fore neck and lower throat appearing to be rather coarser than in the male.

Measurements.—"Total length 23 inches, culmen 1·65, wing 16, tail 7, tarsus 3·7." (*Sharpe*).

My measurements for the female are as follows: wing 13·5 to 15·0 inches, (= 34·2 to 38·1 mm.), bill from front on culmen 1·2 to 1·35 (= 30·1 to 34·2 mm.), and from gape 1·8 to 2·2 (= 45·7 to 55·9 mm.), mid-toe 1·56 to 1·85 (= 39·1 to 47·9 mm.).

Hume records the measurements as "Length 25 to 27·5 inches, expanse 47 to 51, wing 14·25 to 15·25, tail from vent 7·75 to 9·25, tarsus 3·15 to 3·6, bill from gape 2·0 to 2·5. Weight 2 lbs. 10 ozs. to 3 lbs. 12 ozs."

Young Birds.—"Can always be recognized from the adult female, which they most resemble, by the sandy-coloured arrow-head markings which pervade the whole of the upper plumage. The frill is always very small, the crest on the head is represented only by a few elongated feathers, which are only recognized by somewhat coarser black freckling, and the white of the primaries is distinctly inclined to sandy-buff; in some specimens there is an indication of a black band on the feathers of the fore neck." (*Sharpe*).

Distribution.—The Houbara is, so far as is yet known, only a cold weather visitant to the plains of India, being found throughout the Punjab, Rajputana, Sind, Cutch and Northern Guzerat. Oates defines its eastern limit as a line drawn from Delhi on the Jumna river to Baroda, but Hume has recorded having shot one himself in the Meerut district, east of the Jumna, and doubtless other occasional birds will be met with as far east as this bird.

Outside India it is found in west Central Asia as far west as Mesopotamia, whence it straggles commonly into south-eastern Europe and more rarely into northern and western Europe, as far as the British Isles, Persia, Central Asia, as far south as Afghanistan and Baluchistan (throughout the year) and the highlands of West and North-west China, breeding as close to Indian limits as the Persian Gulf and Afghanistan and Beluchistan.

Nidification.—The Houbara breeds in Afghanistan, Beluchistan, Persia and the Persian Gulf westwards almost to Palestine. It has never yet been found breeding actually within Indian limits, but it is quite possible it may yet be found to breed occasionally in Sind. H. E. Barnes records:—

"I feel sure that a few at least remain to breed, both in Sind and Cutch; a friend of mine avers that he has seen eggs in the latter place, but as he did not preserve them, he may have made a mistake; but he is too good a sportsman not to know a Houbara when he sees one. Mr. Doig had excellent reasons for believing that the Houbara bred in the desert between Godra and Renahoe."

Barnes then refers to Colonel Butler's remarks in *Stray Feathers*, which are as follows :—

“Mr. Scroggie, however, who resides at Henjam, imparted an important piece of information which I must not omit, and that is that one or two pairs of *Houbara macqueenii* were breeding in the island and that about six weeks before our arrival, i.e., about the first week in April, a pair (♂ and ♀) were shot there, and that he extracted a perfect egg from the oviduct of the female and put it under a hen to hatch, but that subsequently it was destroyed by rats. I am inclined to think that the greater number of *Houbara* that visit Sind in the cold weather breed in Persia and Afghanistan.”

The nest, which is merely a depression in the sand or earth, seems generally to be placed in the open, though under shelter of some scrubby bush or patch of grass; failing these, in amongst stones or boulders.

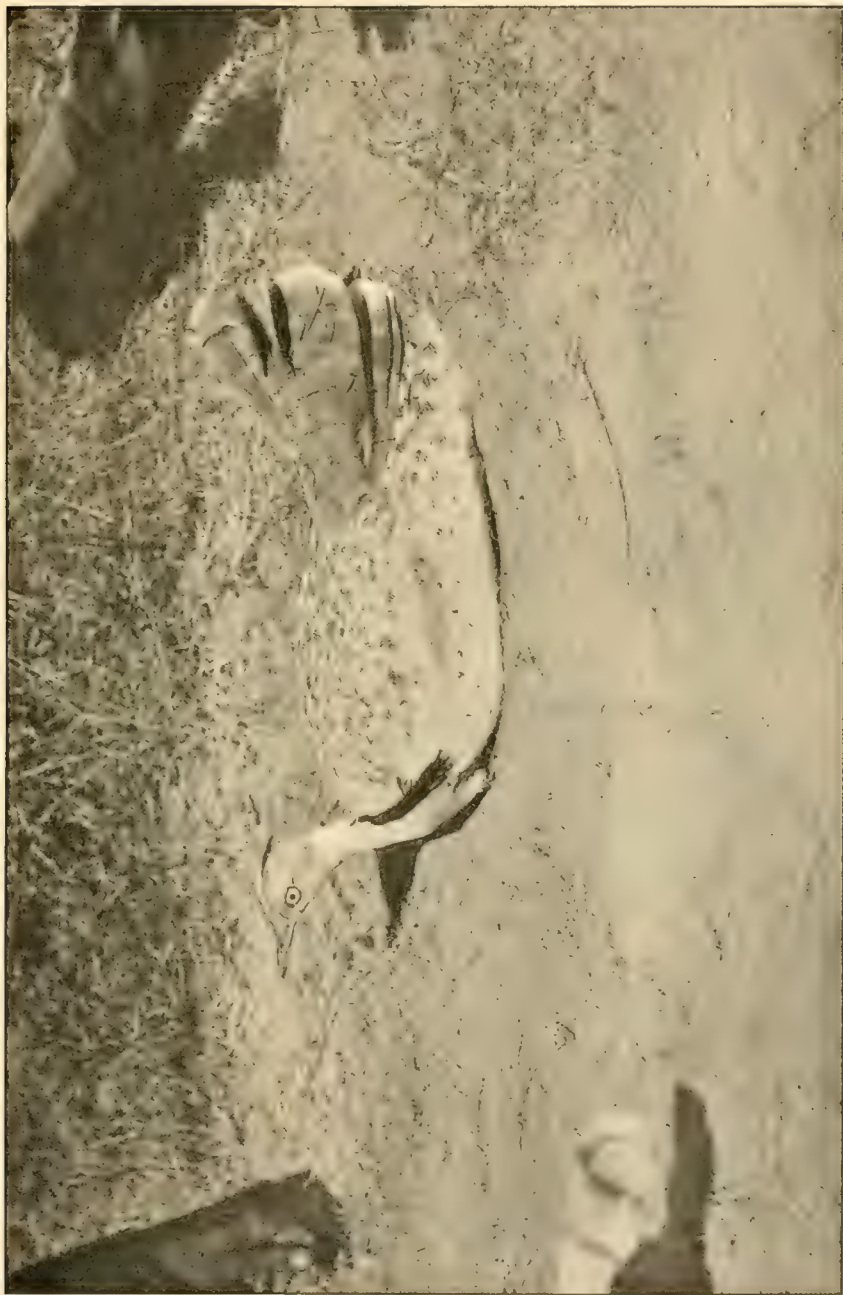
The breeding season in Persia and Mesopotamia is principally May and early June, but a considerable number lay in April and Aharoni took numerous nests at or near Karyatin during this month, some as early as the 7th. The latest date I have recorded is for a pair taken Altai 24th June.

The eggs seem to be generally three in number, but four are frequently laid, and almost equally often two only.

A very fine series of these eggs obtained in Western Mesopotamia have passed through my hands or are still in my collection, and I am therefore able to add considerably to my former notes upon them.

In colour they do not vary greatly. The ground is generally a pale brownish-stone, in some paler and more grey or yellowish, in others darker and still more brown. In some eggs there is a slight olive tint, but this is rarely at all strongly developed, and I have seen only one pair in which this tint was really conspicuous.

The primary markings consist of blotches and spots of umber- and vandyke-brown and the secondary of pale-brown, grey-brown and neutral-tint marks of the same character. In most eggs the blotches are fairly large, not very numerous, and are equally distributed over the whole surface of the egg; in others they are smaller, and in one pair in my collection they are reduced to quite small specks and dots. In nine out of ten eggs the marks are



THE HOUBARA (*Chlamydotis u. macqueeni*).

longitudinal in their character, and primary and secondary are about equal in size and number.

The surface is close and fine and sometimes has a very fair amount of gloss. The shell is strong and smooth, but often has a few tiny knots or corrugations upon it. In shape the eggs are fairly true ellipses, varying from broad sphero-elliptical to rather long ellipses with a smaller end well defined. Fifty eggs average 62.9×45.1 mm. The longest and broadest eggs are 68.6×43.6 mm. and 62.0×48.4 mm. respectively, whilst the shortest and most narrow measure 58.1×45.4 mm. and 62.5×41.6 mm.

General Habits.—The fact that our Indian Houbara has been so much confounded with the African bird, *Chlamydotis u. undulata*, has prevented many persons from collecting specimens of the Houbara when met with on the borderlands of the two species, and the dividing line between the two has not yet been satisfactorily worked out. The B.M. possesses so few specimens of either sort, except for those Indian-killed specimens of *Chlamydotis u. macqueenii* in the Hume collection, that they do not much help in this respect.

Dresser, in his 'Palearctic Birds' gives the habitat of our bird as "N.W. India, Afghanistan, Persia, Central Asia; a rare straggler to Europe and has been met with in Germany, Poland, Finland, Oland, Belgium, Holland, and four times in Great Britain." The African Houbara he gives as extending to Palestine and Armenia.

The Houbara arrives in India as early as the end of August. Hume records the shooting of one on the 27th of August and Butler records the arrival on the 30th of that month. The latter, however, says: "The end of August is exceptionally early for their arrival. The main body do not appear until about the first week in October. A few pairs were breeding at Henjam, Persian Gulf, at the beginning of April, 1877." Butler's record refers to Northern Guzerat and in the Northern Punjab they are reported to arrive at much the same time; a few stragglers appear in early September, but not many are to be found until very late in that month or early in October.

Their departure takes place in March and early April, though Doig's men reported their still being in the Eastern Nara, Sind, in May and June. Doig also adds that "a man voluntarily informed

me one day that he had seen the eggs of the *Tilloor* in the desert at a place near where my man had seen the birds."

Major A. R. Burton informs me that in the Zhob Valley and the Loralai district they are found from September to March.

This Bustard, like the others of the order, is more or less gregarious, but seems never to collect in very large flocks. Hume states that he has put up as many as twenty birds in a flock, but most of my correspondents speak of seeing small flocks of three to five or six, and I have received no information of flocks as large as that seen by Hume. Major Burton, in his letter above referred to, says, that the birds were fairly plentiful in the Zhob Valley, but that he never put up more than eight birds in a flock. On the other hand birds are found very often either in pairs or alone.

Hume was very successful in shooting this Bustard, and he records, in 'Game-Birds,' that in 1867 he killed no less than eighty-three birds, forty-seven cocks and thirty-six hens, in one week in November. He writes in his usual interesting manner on the easiest way to obtain this bird.

"The Houbara greatly prefers running to flying, and when the weather is not too hot, will make its way through the labyrinth of little bushes which constitutes its home at a really surprising pace. So long, as the cover is low, its neck and body are held as low as possible, but as soon as it gets where it thinks it cannot be seen, it pulls up, and raising its head as high as possible, takes a good look at its pursuers. Not unfrequently it then concludes to squat, and though you may have been, unobserved, watching it carefully whilst it was only watching others of the party coming from an opposite direction, it becomes absolutely invisible the moment it settles down at the foot of a bush or stone. Once it has thus settled, especially if it is hot and about noon, you may walk past it within ten yards without flushing it, if you walk carelessly and keep looking in another direction.

"But it is weary work trudging on foot under an Indian sun after birds that run as these can and will, and in the districts where they are plentiful, people always either hawk them or shoot them from camels.

"Off a camel a large bag is easily made, and as, whilst after these Bustards, you get from time to time shots at antelope or ravine-deer, quail, partridges, and on rare occasions, a Great Bustard also, it is not bad fun, though rather monotonous, like the scenery that surrounds one.

"Taking the camel at a long, easy six-miles-an-hour trot, across

one of those vast wildernesses they affect, you will not be long before, raised high up as you are on camel-back, you catch sight of one or more Houbara feeding amongst the bushes. To them camels have no evil import: everybody uses them; none but the veriest pauper walks, everyone rides, and rides camels. The peasant going out to plough his field rides on one camel and puts his plough on the other, which, with its nose-string fastened to the tail of the one he rides, trots along complacently behind. When, therefore, the Houbara see you come along on a camel, they only move a little aside, so as to be out of your line of march, and you at once begin to describe a large spiral round them, so that, while appearing always to be passing away from them, you are really always closing in on them. Sometimes, if the time be early or late, or if the day be cold or cloudy, long before you are within shot, they start off running, and if you press them further, ultimately take wing, flying heavily, and soon re-lighting and running on, never, so far as I have seen, taking the long flights that the Great Bustard does, and never fluttering and sky-larking in the air as do the little ones. Generally, however, if the time be between ten and four, and the day bright and warm, as your spiral diminishes the birds disappear suddenly. They have squatted. Still you go on round and round, closing in in each lap, and straining your eyes, usually in vain, to discover their whereabouts; suddenly, perhaps from under the very feet of the camel, up flutters one of the birds, and after a few strides, rises, to fall dead a few yards further on, as they are easy to hit and easy to kill. Of course, I suppose a trained camel to be used, otherwise, what with flies, keeping up a perpetual twitching of every part of the beast's head, neck and body, and its natural suspicions that you and your gun are up to no good, you will find it by no means difficult to miss even a Houbara, especially if you do not remember always so to slew your camel round as to have the bird well on your left side.

"At the first shot, all the Houbara that are at all close usually rise, but after shooting a brace right and left, and having them picked up and slung, I have known a third blunder up from within a few yards.

"Often, especially when you are out alone and, after breaking up a large flock (which it is always best to do), are working a single bird, you close in and in until you reach the very bush by which you last saw it, and yet can find no trace of it. You pull up, as this generally starts the bird, but sometimes even then nothing is to be seen. The way they will squat at times on an absolutely bare patch of sand is astonishing; their plumage harmonises perfectly with the soil, and you will have a bird rise suddenly, apparently out of the earth, within a few yards of you, from a spot where there is not a blade of cover, and on which your eyes have perhaps been

fixed for some seconds. This is especially the case about mid-day, when the sun is nearly vertical and no shadow is thrown by the squatting bird. Sometimes they try another plan, they get behind a single bush, and, as you circle round, they do the same, always keeping the bush between themselves and the sportsman; here, unless the sun is quite vertical, their shadow projected on the ground, apart from that of the bush, is sure, at certain positions in the circle, to betray them, and a shot through the bush brings them to bag.

"In some parts of the country the Houbara greatly affect fields of mustard and other crops yielding the oil-seeds of commerce, of which there is a vast variety, known by half-a-dozen different names in almost every province.

"When these fields are well-grown, and are, say, a little higher than the bird itself stands, exceptionally good sport may at times be obtained.

"They cannot run here, the growth is too dense, and a line of guns and beaters, sweeping a large field of this kind into which a flock has been marked, will often account for the whole party, flushing them like so many pheasants out of a dense turnip-field, with buckwheat lines along a cover-side."

Mr. M. M. Currie has sent me the following interesting note on the occurrence of the Houbara in Ludhiana and Dhera Ismail Khan. The "Bustard," *i.e.*, the Lesser Bustard or Obara, commonly called "Tilur" in the Punjab, was pretty common in the Dhera Ghazi Khan where I shot a certain number in the cold weather of 1908-09. They were most common in the dry tract at the foot of the Sulimans, where they seemed to be especially fond of lying up in a kind of coarse grass locally known as *ghamm*. Later in the year they haunt the fields sown with oil-seeds (*taramira*). I have also seen them in the lowlands down by the Indus. The usual number seen together was three or four, but once or twice I have seen as many as a dozen together. The method of shooting most often employed is with camels. The sportsman dismounts, and taking cover behind the camel, continues to approach in circles till within range, when he advances towards the spot where the bird is lying till he puts it up.

"The best bag I ever saw made in this manner was by a companion of mine who got six birds one day, whilst I, not so fortunate, shot but one. It is said to be possible at times to walk them up in the oil-seeds, but I never did so with any success."

It is perhaps quite as often hawked as shot, though naturally one does not expect to make as big bags in the former as in the latter way.

Major Drake Brockman thus describes a day's Houbara-hawking near Peshawar.

"Some of the pleasantest days I can remember having passed in India were spent at Peshawar in the cold weather of 1893 and 1894.

"Apart from the excellent pack of hounds there and the good sport we had, I think that even more pleasant days were those we spent out hawking Houbara on the Jamrud Plain in the company of Mr. Donald, Assistant Commissioner, and Colonel Aslam Khan, of the Khyber Rifles.

"The Jamrud Plain, a few miles out of Peshawar, is covered to some extent with low sparse scrub-jungle and small boulders intersected with numerous dry water-courses, mostly small, but some of a considerable width. The road runs right through this plain, and on either side the latter stretches away to the foot of the hills, where far away—about ten miles distant—can be seen Fort Jamrud, situated at the mouth of the famous Khyber Pass.

"After an early breakfast we would drive out in the keen morning air to our rendezvous, some five miles or so out on the Jamrud road, to which our ponies had already been sent on ahead to wait for us. Here also Colonel Aslam Khan would generally wait for us, together with a few men of the Khyber Rifles, to act as an armed escort party, and also to be extended in line on either side of us so that they might act as beaters.

"Having mounted our ponies we would strike off across the Plain in the direction of the Minitini Fort, the men with the falcons—they were peregrines we usually used for this sport—on either side of us, and the remaining Sepoys extended as I have said.

"After going in this manner for perhaps the best part of a mile, sometimes much less, up would get a Houbara, generally about eighty yards or so in front of our line. Immediately he was spotted, one of the falcons was unhooded and thrown off, and as soon as he sighted the Houbara a grand race would begin. The peregrine, like an arrow from the bow, would hurl itself in pursuit of its quarry, and we would hasten after both, galloping for all we were worth, and galloping across the boulder-strewn and broken plain was exciting enough in itself, though it was wonderful the way our little country-bred ponies kept their feet and got over the ground.

"Ride, however, as hard and as recklessly as we could, the two birds would leave us soon behind, although the Houbara, with the steady beats of the wing, seemed to be going comparatively slowly.

"At last the falcon would be within striking distance of the Houbara, there would be one lightning-like swoop from the former from far above, and then, if he struck true, the tragedy was over for the bustard, and riding up we would find them in some small open place and the Houbara dead, the hawk still grasping it on the ground. The men would then come up and secure the falcon, give it a tit-bit to eat and then hood it again.

"Remounting our ponies and once more extending our line, we would go on in the same way, and, if luck favoured us, might perhaps get another Houbara. Not every time, however, were we successful, for sometimes the Houbara would succeed in eluding the hawk once and yet again, sometimes, indeed, escaping altogether.

"By the time we had worked across the plain our appetites would remind us that it was time for lunch, so, having selected a suitable spot with some shade if possible, we would dismount and partake of the good cold fowl and Pathan *roti* provided for us all by Colonel Aslam Khan.

"But the winter days soon close in, even in this land of sun, and, after we had rested, a glimpse at the western sky showed us that if we wanted any sport *en route* it was time we once more got into our saddles. Accordingly, mounted once more, we would continue to beat back to the place where we had ordered our traps to wait for us. If our luck were still in the ascendant we might get another run or rather flight, but we generally considered that two birds in a day was a good day's average. Arrived at the road, we would say good-bye to Colonel Aslam Khan and drive homeward, well wrapped up, for the winters in Peshawar are very cold, pleasantly tired after a delightful day in the most perfect winter climate in Northern India.

"I am sorry to say that owing to the swift flight of Houbara and hawk we were never up quite in time to see exactly what happened at the kill or to see the hawk actually striking the Houbara. There seemed to be always a lot of feathers about, and it looked as if there might have been a bit of a tussle between the two, but they might also merely have been knocked out of the Houbara from the force with which, when struck by the falcon, it fell to the ground. We noticed, too, that the Houbara always seemed to emit some secretion, for there was generally a mess of this around."

Mr. F. J. Mitchell *in epistolâ* also mentions this curious habit of the Houbara. He writes "the Houbara when pursued often rises, like a heron under similar circumstances. If he can get immediately over the pursuing hawk he squirts him with a stinking gummy (anal) liquid which sticks the hawk's feathers together so that he cannot fly.

Sometimes the hawk falls like a stone when thus squirted, and he has to be washed with warm water before he can fly again."

This habit seems to be common to the members of this family, most of which pass this offensive fluid when attacked or wounded.

Hume says that sometimes very large bags of Houbara are made, and that in the Pairi district in favourable years "any man could shoot twenty in a day, and General Marsten, while Superintendent of Police in the Kurrachee district, shot, I believe, forty-eight (and some people say fifty-eight) on one occasion."

As regards the food of the Bustard there is little to add to what Hume has recorded. They are more or less omnivorous, as are the other birds of this family, but they are far more vegetarian in their diet and are not nearly as gross feeders as the larger species. They will, when driven to it by stress of hunger, sometimes eat small reptiles, &c., but they do *not* eat these in *preference* to green food, and they are very partial to young wheat and similar crops, and are said sometimes to cause considerable injury to such crops in the Punjab.

Their flight is more like that of *Otis tarda* and *Eupodotis edwardsi* than like that of *Otis tetrax* or the floricans. They progress by slow steady beats of the wing and cover the ground at a very good pace, and when being hawked turn, twist or drop to the ground with wonderful rapidity. As a rule they run before taking to wing, but can take to flight quite easily without any preliminary walk, and when flushed in thick crops rise like pheasants and are then easily shot.

Our coloured plate of this bird is both beautiful and correct. The attitude shown thereon is a semi-courting one; when the bird reaches the full frenzy of his passion the tail is thrown back well over the back and the wings are trailed until they touch the ground, and in some cases the ends of the feathers are elevated and the shoulders are depressed, whilst the wings are forced outwards so as to form a sort of screen extending on either side of the breast.

The collar on the breast of the bird in the picture is almost absent, and generally shows a good deal more than this.

Genus SYPHEOTIS.

The principal generic distinction between the birds of this genus and other bustards is the greater comparative length of the legs. The tarsus in *Sypheotis* is equal to rather more than one-third the length of the wing, whereas in all other bustards it is only equal to one-fourth. The chief characteristic relied on by Blanford was the supposed fact of the males putting on a seasonal breeding-plumage. It, however, now seems quite certain that the male *Sypheotis bengalensis* retains this adult plumage, when once fully acquired, throughout the year, though the smaller bird, *Sypheotis aurita*, does, on the contrary, acquire an annual nuptial plumage. The primary quills of both species are notched on the inner web and are very attenuated, but especially so in *aurita*.

In the breeding season the males of both species, and during the whole year the fully adult males of *Sypheotis bengalensis*, have the head and the whole of the lower parts black, and both species acquire ornamental plumage either on the head or neck. *Sypheotis bengalensis* is crested and has long, full feathers all down the neck to the breast, whilst *Sypheotis aurita* has the feathers of the side of the head and chin somewhat lanceolate and lengthened, and a curious tuft of long feathers from each side of the head below the ear-coverts, the longest of which have the stems narrowly webbed and the ends spatulate.

Sharpe divides *Sypheotis* into two genera, creating a new genus *Houbaropsis* for the larger bird and retaining *Sypheotis* for the smaller. The fact of the latter having a seasonal change of plumage and the former not having one would add considerable strength to the reasons for dividing them, but for the purpose of this work I retain them in the one genus.

Key to the Species.

- Wing 7 to 10 inches, tarsus 3'35 to 4'5 *S. aurita*.
 Wing 13 to 15 inches, tarsus 5 to 6'2 *S. bengalensis*.



THE LESSER FLORICAN or LIKH

female.

Sypheotis aurita.

male

SYPHEOTIS AURITA.

THE LESSER FLORICAN OR LIKH.

? *Otis indica*, *Gm. Syst. Nat.* i, p. 725; *Lath. Ind. Orn.* ii, p. 661; *Oates, Cat. Eggs B. M.* ii, p. 87; *Sharpe, Hand-L.* i, p. 175.

Otis aurita, *Lath. Ind. Orn.* ii, p. 660.

Otis marmorata, *Gray & Hardw. In. Orn.* i, pl. 60.

Sypheotides aurita, *Less. Rev. Zool.* 1839, p. 47; *Blyth, Cat.* p. 259; *Jerdon, B. of Ind.* iii, p. 619; *King, J. A. S. B.* xxxvii, Part 2, p. 216; *MacMaster, ibid.* xl, Part 2, p. 215; *Stoliczka, ibid.* xii, Part 2, p. 250; *Gould, B. of Asia*, vii, pl. 57; *Hume, S. F.* i, pp. 136, 228; *Adam, ibid.* p. 393; *id. ibid.* ii, p. 339; *Ball, ibid.* p. 428; *Le Mess. ibid.* iii, p. 379; *Blyth, B. of Burm.* p. 152; *Butler, S. F.* iv, p. 10; *Fairb. ibid.* pp. 262, 266; *Butler, ibid.* v, p. 231; *Ball, ibid.* p. 419; *Hume & Marsh. Game-B.* i, p. 34; iii, p. 425; *Hume, Cat. No.* 839; *id. S. F.* viii, p. 111; *MacInroy, ibid.* p. 491; *Butler, Cat. Birds of Sind, etc.* p. 56; *id. Cat. B. S. Bom. Pres.* p. 71; *Vidal, S. F.* ix, p. 77; *Davidson, ibid.* x, p. 318; *Hume, ibid.* p. 412; *Barnes, B. of Bom.* p. 322; *Murray, Vert. Fauna Sind*, p. 220; *Barnes, J. B. N. H. S.* i, p. 57; *id. ibid.* vi, p. 13; *Laurie, ibid.* p. 94; *Littledale, ibid.* p. 199; *Davidson, ibid.* xii, p. 64; *Dewar, ibid.* xvi, p. 495.

Eupoditis aurita, *Gray, Cat. M. B. Nepal Pres. Hodgson*, p. 130; *id. Hand-B. B.* iii, p. 9.

Sypheotis aurita, *Hume, Nests & Eggs, Ind. B.* p. 561; *Oates, 2nd Edit. ibid.* iii, p. 380; *Blanford, Avifauna B. I.*, iv, p. 198; *Sharpe, Cat. B. M.* xxiii, p. 313; *id. Oates, Game-B.* i, p. 419; *Finn, In. Waders*, p. 125; *Symons, J. B. N. H. S.* xix, p. 261; *R. K. ibid.* p. 995; *Stuart Baker, ibid.* xxi, p. 721 (1912); *O'Donel, ibid.* xxii, p. 201 (1913); *Kinnear, ibid.* xxii, p. 202 (1913); *Whistler, ibid.* xxiii, p. 581 (1914); *Kyle-Fellowes, ibid.* xxvi, p. 289 (1915); *Marryat, ibid.* xxvi, p. 674 (1919).

Vernacular Names. *Ker-mor*, Guzerat; *Sun-mor*, Deccan and Marathi districts; *Chini-mor*, Belgaum; *Khartitar*, Bheels; *Likh*, Chota Charat, N.W. Provinces; *Charas*, Chulla Charas, Southern India; *Kannoul*, Kanarese; *Niala nimili*, Telugu; *Wurragu Koli*, Tamil; *Bursati* or *Kala Tugder*, Rohtak, Gurgaon.

Description. **Adult Male.**—Whole head and neck, including ear-plumes glossy black; chin and centre of upper throat pure white. Remainder of underparts black; the breast, like the head and neck,

is a deep velvety black, often highly glossed, but the abdomen is less glossy, and this and the under tail-coverts are sometimes rather dingy and brownish. Below the hind-neck and between this and the back there is a broad band of white which descends as far as the upper breast, often encroaching upon it for almost an inch on either side. Upper plumage a sandy-buff, each feather with the centre having a spear-shaped black or brownish-black patch, margined with yellowish-sandy, the rest of the feather vermiculated with black or brown. On the lower back the vermiculations are less definite and the central marks obsolete, whilst on the central tail-coverts their place is taken by definite cross-bars of deep brown. Rectrices sandy-buff with a rufous tinge, finely vermiculated as on the back and with four definite cross-bars of blackish-brown. Scapulars like the back, but those nearest the shoulder-coverts more or less freckled with white. Larger wing-coverts black, the hidden portions of the inner webs freckled with white and brown; remaining median and lesser coverts, where visible, white; the basal portion of the secondary coverts freckled with brown and a few coverts next the inner secondaries approximating these in colouration, but retaining a great deal of white. First two, three, or in some cases four, outermost primaries uniform brown; the remainder with broad bars of rufous-buff, these widening towards the secondaries. Outer secondaries mottled brown and buff, sparsely freckled with white at the tips, inner secondaries like the back, but with white freckling on the edges near the coverts, and with the smallest feathers next the scapulars marked with rufous-buff.

The feathers of the upper throat are lengthened, those behind the ear-coverts being greatly so, the three longest sometimes reaching as much as five inches in length, and generally exceeding three and a-half inches. As a rule, the three longest feathers are graduated, and though in some cases they are subequal, there is nearly always a great difference in length between these three feathers and the others, which may vary between one and two inches. These feathers, more especially the longer ones, are spatulate in shape.

Colours of Soft Parts.—“The irides are dull-yellow, sometimes very pale, sometimes brownish; the legs pale, somewhat fleshy yellow, sometimes hoary, sometimes more dusky; the bill is pale-

yellow, somewhat fleshy towards gape, the ridge, tip and more or less of the upper surface shaded with dusky, horny brown." (*Hume*).

Measurements.—Wing 7.1 to 8.05 inches (= 180 to 204 mm.), tarsus 3.35 to 3.75 (= 85 to 95 mm.), bill at front 1.25 to 1.5 (= 31.7 to 38.1 mm.), tail 3.25 to 4.5 (= 82.5 to 114.3 mm.).

"Length 17.25 to 19 inches, expanse 27.5 to 32, wing (to end of longest primary) 7.3 to 7.9, tail 4.1 to 4.5, tarsus 3.65 to 3.9, bill from gape 2.0 to 2.1. Weight 14 ozs. to 1 lb. 4 ozs." (*Hume*.)

"Total length 15 inches, culmen 1.5, wing 7.9, tail 3.5, tarsus 3.5." (*Sharpe*.)

From the above measurements it will be seen that this bustard varies very considerably in size, but the measurements first given include those of the whole of the British Museum series (some eighty-five birds), as well as many others which have passed through my hands, so may be taken as showing fairly satisfactorily the range of variation. The only bird of the British Museum series omitted from the above measurements is an abnormally small bird with a wing of only 6.85 inches (= 174 mm.). It may be noticed that I have not given measurements either of length or expanse in describing this or any other bird, but I have omitted these measurements intentionally, as they depend far too much upon every individual sportsman's way of measuring and the extent to which wings and neck are stretched during the operation.

Adult Female.—Forehead, crown, and occiput black, the feathers more or less tipped with buff and the inner webs of the central feathers also buff, forming a well-defined mesial streak; lores, fairly well-defined supercilium and post-orbital region buff with a few black specks and a line of black specks running under the eye; sides of head and ear-coverts buff, immaculate, or with a few fine specks only; chin, throat, and sometimes the region below the ear-coverts white. Posterior aspect of the neck buff, finely vermiculated with black or dark-brown, anterior aspect buff, with broad splashes of black forming two broad streaks down to the breast; sides of the neck next the shoulders with similar streaks; breast buff with bold black markings and freckles, the latter often forming crescentic marks. Remainder of lower parts buff, often almost white, the flanks more or less freckled and barred with blackish and the innermost axillaries black.

Back, scapulars, rump and upper tail-coverts buff, each feather with a broad central spear-head of black, surrounded with buff. These marks disappear on the rump, which is more indefinitely marked. Tail like the back, but without the spear-head marks, and with four broad bands of black. Quills of the wing as in the male. Wing-coverts buff, the outer sparsely barred with brown or black, the inner and smaller profusely barred, and to some extent freckled with black.

Colours of Soft Parts.—Inglis sends me a note on the soft parts of a female shot by him in Behar as follows: "Bill dusky-red, culmen dark-brown, gape and base of lower mandible yellow; iris yellow tinged with red; legs dull dusky yellow."

Measurements.—Wing 8·25 to 9·75 inches (=209·5 to 247·6 mm.), tarsus 3·55 to 3·85 (=90·2 to 98·8 mm.), bill at front 1·45 to 1·65 (=36·8 to 41·9 mm.), tail about 4·5 (=114·3 mm.).

Female.—"Length 18 to 21·4 inches, expanse 29 to 36, wing 9·0 to 9·75, tail 4·7 to 5·0, tarsus 3·9 to 4·4, bill from gape 2·28 to 2·3. Weight 1 lb. 2 ozs. to 1 lb. 10 ozs." (*Hume*).

There are several females in the British Museum collection with wings under nine inches, but these are probably young birds. Fully adult birds, i.e., over eighteen months, will not often be found with a wing of less than nine inches.

Adult Male in winter plumage.—Similar to the female, but retaining a considerable amount of white on the wing.

Young Male.—Like the female.

Nestling.—"An almost uniform dirty pale-yellow colour, with an unclosed V on the crown of the head in dingy black, and blotches, rather stripey, of black on the wing, back and sides, and about the ears; legs and beak a colour between pale-blue and pale-pink; and on the tip of the beak a little lump of pale pearly-white," (*Davidson* as quoted by *Hume*).

Distribution.—In 'Game-Birds' *Hume* thus describes the habitat of the Lesser Florican:—

"I find great difficulty in defining the limits within which the Lesser Florican occurs; firstly, because it is irregularly migratory, and secondly because individual birds straggle in the most unaccountable manner hundreds of miles beyond the furthest districts which it at all regularly visits.

"Dr. Jerdon tells us that 'this species is found throughout India, from near the foot of the Himalayas to the southernmost districts,' but this conveys, I think, a somewhat erroneous idea of its distribution, which is not nearly so wide as this might seem to imply.

"Although a certain number are probably permanent residents of Khandesh, Nasik and Ahmednagar, the real home of the Lesser Florican is in the drier portions of the Peninsula, lying east of the Western Ghats and south and east of the Godavari.

"It is, of course, confined to plains and open country, and does not ascend any of the hills, though a single specimen was once killed, I hear, on the slopes of the Nilgiris, between Neddiwattum and Pykarra, going down to the Wynaad.

"During the rains, when it breeds, although many breed in the Deccan, as, for instance, about Sholapur, the majority, I think, move northwards and westwards, extending over the western parts of the Central Provinces, the Central India Agency, the southern and central portions of Rajputana, Khandesh, Guzerat, Cutch-Kathiawar and Southern Sind.

"The migration is, however, irregular, as in some years it extends much further than in others. The birds are plentiful in one year where in the next none or few are to be met with.

"In years when the rainfall is plentiful, they are pretty common during the monsoon a little south of Delhi, in Rohtak and Gurgaon. Generally, there are a good many about Jhansi and so on, but except as stragglers, they are not found in those parts of the country that I know further north than a line joining Sirsa and Delhi, nor do they cross the Jumna in any numbers.

"Although I have known single specimens killed near Lucknow, Sultanpur, and other places in Oudh; though I have myself shot single birds occasionally in the Meerut and Etawah districts; though Ball got a specimen in Serguja, Hodgson others in the valley of Nepal; though Jerdon says he has known of their occurrence in Purneah, and Parker tells me they have occurred in Nuddea; though one specimen has been killed on the Mekran coast near Gwader and another at Sandoway in Arrakan, I do not, as at present informed, consider that either Beluchistan, the Punjab, the North-Western Provinces, north and east of the Jumna, Oudh, Chota Nagpore or any part of Bengal or the countries eastwards, can be properly included within its normal range. It occurs nowhere out of India."

It will be seen that Hume refers to a bird shot at Sandoway on the Arrakan coast. This record is from the 'Bengal Sporting Magazine' for 1835, where a writer, on p. 151, records the shooting

of a Lesser Florican, and this record is quoted by Blyth in his 'Birds of Burmah,' p. 152. It is, however, extremely doubtful if this record is a really correct one, and *Sypheotis aurita* should not be accepted as a Burmese bird on the strength of it. The next point furthest east from which it had been recorded up to 1913 is Dinajpore, from which place there is a specimen in the British Museum, and further south of this again from Purulia, Purnea and Nadia, from each of which district stragglers are occasionally obtained, but it had never been obtained from any of the districts east of the Teesta or south of the Brahmapootra rivers, leaving thus a very wide stretch of country or sea to be passed over before the Arrakan coast is reached.

To Hume's districts of Purnea and Nadia in Bengal, from both of which districts I have also seen specimens, must be added Maldah, where birds have been seen and shot by Mr. G. Hennessy.

In 1913 Mr. H. V. O'Donel recorded this bird from Hasimara Tea Estate on the Toorsa river, some fifty miles east of the Teesta. Specimens were seen on several occasions—one young male being shot—but all in the months of April, May and June. Mr. O'Donel reports them as very irregular in their visits and never anything but "uncommon."

As regards the Punjab and North-West Provinces, birds wander into these so regularly, year after year, though in but small numbers, that it is hardly possible to regard these Provinces as outside their normal habitat.

In the south, Major Ch. MacInroy says that "Florican are pretty numerous throughout East Mysore, but, for some reason which I cannot divine, are not nearly so much so in the western division of the Province." He further records a bag of thirty birds made some twenty-five miles from Bangalore and adds that four or five birds have been killed in a morning near Coconada.

In his list of the Birds of the South Konkan, Vidal remarks that the Lesser Florican "rarely pass the Ghat barrier which divides the Konkan from the Deccan. In seven seasons spent in the Ratnagiri district I have only seen two birds. . . . I have also heard of one having been obtained at Dapuli."

Mr. H. S. Symons reports a bird shot in 1909 near Panwell in

the S. Bombay Presidency, and another some twenty years earlier at Mahaluxmi; Dewar, it should also be mentioned, notes that it is seen sometimes near and about Madras, but it occurs in that district regularly and is resident, and it extends north into Orissa, Blyth having shot it near Cuttack.

In the Ratnagiri district Mr. G. W. Vidal occasionally saw the Likh, and Mr. J. S. Hardy put up a bird in that district on the 7th February, 1913.

In a footnote, p. 24 of 'Game-Birds,' Hume quotes Hodgson as saying: "Appears here (Valley of Nepal) about middle of May and disappears middle of June," and then he (Hume) goes on to say: "It may be that there is a permanent colony of this species, of which I know nothing as yet, in northern Behar, Gorakhpur, Busti, etc."

In partial confirmation of this surmise Mr. A. E. Osmaston sent me the skin of a young male from Gorakhpur, and in the letter sent with it wrote: "I also saw them at the beginning of last rains (1909) but I have never seen them at any other time of the year here and I presume they only come here to breed, and I think only a few come even then, as the grassy land they seem to like is very limited in extent."

This record, therefore, though confirming the presence of Likh in and about Gorakhpur during the breeding-season, does away with the theory of a "permanent colony," and implies that these birds as well as those which reach Nepal migrate from a good deal further south than Hume imagined. From Bihar Mr. Inglis reports them as decidedly rare; he has not seen many himself, but he tells me that he has skins of birds shot in Bihar in April and May, in one case that of a male just assuming breeding-plumage.

Nidification.—The breeding-season of the Lesser Florican varies much in different localities. Jerdon says that some birds breed in Southern India from July to November, and that he has put the hen bird off her nest in August in the Deccan, and in October near Trichinopoly, and he also says that he has heard of hens being found sitting as late as January. Hume says that the majority breed in September and October, and this agrees with the observations of most other observers in the more northern of the bird's breeding-haunts. As regards Kathiawar, however, it would seem that they commence rather earlier. Colonel L. L. Fenton writes me:—

"Only an occasional bird is to be seen at any other season of the year, but about the end of June they arrive in great numbers in the Kathiawar *Vids* for the purpose of breeding. The large *Vids* round Rajkot, such as Kalipat, Kotaria, Ghanteshwar, Damalpur, etc., are celebrated for them at this season of the year, and I have here seen over twenty birds in one morning.

"There seems always to be a preponderance of cock birds, but perhaps they are more in evidence than the hens, owing to their habit of jumping, and hens are, I think, at all times more difficult to flush than are the cocks. I cannot say where the greater number betake themselves after the breeding-season is past, but it is an undoubted fact that very few remain in the Province, as they are rarely met with in the cold weather."

Captain G. F. S. Routh writes me that he took four eggs of this Bustard, two showing slight signs of incubation, on the 5th August, 1913, at Marwar. The nest was a mere oval depression in the ground with a few grass-blades strewn in it.

Allusion has already been made to the curious habit displayed by this bird of jumping into the air, to some height above the surrounding vegetation, in order to attract the notice of the opposite sex. Generally it is the male alone which resorts to this trick, but sometimes, at all events, the female also does indulge in it. Hume himself says that he has seen the female jumping, though he adds that this is only for the purpose of catching flies, etc., as they are disturbed from the grass. Mr. Wenden, however, whom Hume quotes, distinctly saw the female bird as well as the male jumping, and thus describes his experience:—

"On the 16th I went out and watched this bird for more than an hour, just about the time at which she had been flushed on the morning before from the single egg. From the tree on which I sat, with my binoculars, I saw her running rapidly out of the dense preserve, across the open and into the scanty patch in which was her egg. Here she moved about for some minutes feeding, and every now and then sprang into the air with a low, clucking cry, which was answered by the male bird from the preserve, though at first I could not see him. Then, as though a sudden thought had struck her, she darted to the nest, and after one or two springs, and walking round and round the egg, she squatted and deposited another. While she sat, she was silent, but the male bird, who had now advanced closer to me, kept springing in the air and crying continually. The operation of laying the egg seemed to last about twenty minutes, i.e., from the



BEATER IN CUTCH WITH LESSER FLORICAN OR LIKH
(*Sypheotis aurita*).



FEMALE LESSER FLORICAN ON NEST.

time she sat to the time she rose, and having made another spring or two walked round the eggs ; she then made straight tracks for the dense grass where the male bird was calling.

"I went out quite alone on this watching expedition, and all was quite quiet, and the birds were at their ease ; but while I was still in the tree, a man came into the preserve with some cattle, and then I saw both birds spring several times *silently*, and after that I saw or heard nothing of them."

Mr. Davidson also describes this quaint habit at some length ; he says :—

"The Florican breeds all round Sholapur in considerable numbers wherever there are grass-preserves with long grass. During the breeding-season they seem chiefly to haunt the thinnest patches of long grass rather than those full of small bushes ; they are at this period exceedingly difficult to flush, particularly the hens, which, even if you succeed in forcing them to rise, get up only at your feet and make but very short flights. The cocks are not quite so difficult to flush, but you are obliged to run towards them to get even *them* up, if you simply walk after them they will rarely rise. Their whereabouts are, however, generally easily discovered by their frog-like call, and their occasional sudden jumps up into the air. They do not seem to call much when the sun is bright, but chiefly in the morning and during cloudy days. I have often watched them flying or jumping, but I am still uncertain why they do it. My original impression was that they sprung up to seize insects from the grass-stalks, but I have long abandoned this idea, as they rise much above the grass. Moreover, I have only seen one bird thus rise that could have been a female, and this was dark-coloured, and probably a male that had not assumed breeding-plumage, and I am inclined to consider these sudden flights as simply one of those bridal displays so common in the males, especially of gallinaceous birds, such as the flapping of the wings in pheasants, the nautch of the peacock, the lek of the Capercaillie, and the pouch-inflated strut of the big Bustard, and if it can be certainly established that this habit is confined to the males no alternative solution seems open to us."

The Lesser Florican is generally said to be unlike most of its family, in India at all events, in that it is monogamous, whereas the others are either polygamous or "promiscuous," and the male is said to remain with, or near the hen, even after incubation has begun. Although this seems to be a generally-accepted fact, there are a good many points which would seem to be against it, and personally I

should doubt if it be correct. In the first place male birds which display *continually* throughout the breeding-season seldom keep to one wife for the whole period, nor, as a rule, are monogamous males as pugnacious as are polygamous birds. Jerdon's description of the display and pugnacity of the Likh certainly look like attributes of a polygamous male. He writes :—

“The full and perfect breeding-plumage is generally completed during July and August. At this season the male bird generally takes up a position on some rising ground, from which it wanders but little, for many days even, and during the mornings especially, but in cloudy weather at all times of the day, every now and then rises a few feet perpendicularly into the air, uttering at the same time a peculiar low croaking call, more like that of a frog or cricket than that of a bird, and then drops down again. This is probably intended to attract the females, who before their eggs are laid wander greatly, or perhaps to summon a rival cock, for I have seen two in such desperate fight as to allow me to approach within thirty yards before they ceased their battle.”

A writer in the 'Field' of May 2nd, 1908, remarks of the Likh :—

“Florican have very peculiar habits. I do not think they pair or that they are polygamous. They appear to go in for polyandry, if one can apply such a term to birds. In the breeding-season the males have a most peculiar custom of leaping several feet into the air, at the same time uttering a call similar to two sticks hit rapidly together, or the croak of a frog. This is done to attract the females. The latter come to the males for the purpose of mating, but once eggs have been laid and incubation has commenced there appears to be no companionship between them.”

The Bengal Floricans, males and females, undoubtedly do *not* pair at all, and the male is neither polygamous or monogamous ; yet its courting displays are identical with those of the Lesser Florican, as is the habit of the male of displaying in one particular spot whilst the females wander about the country. It is probable, therefore, that when we come to know the domestic habits of *Sypheotis aurita* more intimately they will prove to be similar to those of *Sypheotis bengalensis*.

The Lesser Florican makes no nest in which to deposit her eggs, nor does she, as a rule, even trouble to find or make a hollow for this purpose, merely depositing them on the ground in some small

bare patch in a field of grass. The grass-field selected is seldom one of any very great size or having dense growth in it, and the bird seems to prefer small pieces of grass of some two feet or so high and of scanty growth. The bird watched by Mr. Wenden deposited its eggs "on the bare ground, which was perfectly level (without the least signs of scratching), in some thin scanty grass, about two feet high and about two yards in from the edge of the grass-patch. Not a hundred yards from the plot of grass in which the eggs were deposited was a preserve, over a mile long by a quarter broad, of very high dense grass, a far more likely place, one would have thought, for so wary a bird to lay its eggs."

When the bird does lay its eggs in a vast stretch of grass, as is sometimes the case in Kathiawar, it is said almost invariably to choose some part where the grass is shorter and more scanty than elsewhere and also often to make use of some bare spot close to the outskirts of the field.

The nest found by Mr. Wenden contained three eggs, one found in it on the 15th, one laid on the 16th and a third on the 18th; this corresponds with what we should expect and with what I have heard from other observers, and it seems, therefore, fairly certain that the species lays its eggs on alternate days.

As a rule the full clutch of eggs consists of four, but often only three are laid, sometimes but two and very rarely five. I have never seen a clutch with five eggs myself, but Lieut. F. Alexander recorded that this number was sometimes laid and Mr. James once found five chicks together.

In shape the eggs are typically very broad ovals, more spherical than those of any of the other Bustards; but except for this they are hardly distinguishable from those of the Lesser Bustard, *Otis tetrax*, though on an average they seem considerably smaller. For instance, the average size of the twenty-six eggs of the Likh in the British Museum collection is 1.82×1.6 inches (= about 46×40.6 mm.) whereas the twenty-three eggs of *Otis tetrax* measure 2.07×1.51 (= about 52.6×38.2 mm.), these figures showing well the difference in comparative shape and size in the eggs of the two species.

Hume gives the average of twenty-three eggs as 1.88 inches nearly, by rather more than 1.59 (= 48×40.5 mm.) and the average of

twenty-eight eggs which have passed through my hands and are not included in any of the above is 1.84×1.6 ($= 46.8 \times 40.3$ mm.)

The surface of the shell is very smooth, though pitted with tiny pores, and there is always a considerable gloss, very highly developed in many cases. The texture is fine and very close.

Hume thus describes his series of eggs now in the British Museum:—

“The eggs, like those of the Great Bustard (which, though smaller, they greatly resemble), vary much in size, shape and colouration.

“Typically they are very broad ovals, with a feeble tendency to a point at one end; but some are nearly spherical, some are purely oval, while one or two approach a plover shape.

“The shell, everywhere closely pitted with miniature pores, is stout but smooth, and has always a slight, and at times a brilliant gloss.

“The ground colour varies from a clear, almost sap-green, through various shades of olive-green, drab and stone colours, to a darkish olive-brown. I have seen no specimens exhibiting the blue and bluish grounds occasionally met with in the eggs of the Great Indian Bustard.

“The markings are brown, reddish or olive-brown, occasionally with a purplish tinge, in some very faint and feeble, obsolete or nearly so, a mere mottling, in others conspicuous and strongly marked; but in the majority neither very faint nor very conspicuous. In character they are generally cloudy streaks, more or less confluent at the broader end (from which they run down parallel to the major axis) and more or less obsolete towards the smaller end. Occasionally, however, they are pretty uniformly scattered over the whole surface of the egg.

“In size the eggs vary from 1.77 to 2.06 inches in length, and from 1.5 to 1.7 in breadth; but the average of twenty-three eggs is 1.88 nearly, by rather more than 1.59.”

The eggs in my own collection agree well with the above but there are one pair which deserve separate description. These have the ground colour a most beautiful green-grey, very pale and almost silver in tone. The markings are as described by Hume, but are unusually bold and stand out conspicuously on the pale ground, making them both very handsome.

General Habits.—The Lesser Florican is undoubtedly locally migratory, but, as Hume remarks, its migrations are most uncertain

and irregular, and are probably governed by the state of the rains and food supply, and possibly by other factors not yet known either to field-naturalists or scientists. At present, all that can be said is that during the breeding-season the birds seem to concentrate in suitable places in the centre of their habitat and after this season is over to disperse, more or less, in all four quarters, stragglers then appearing far from any of their favourite haunts. Hill-ranges certainly divert and interrupt these local migrations to a great extent wherever met with, and it is more than possible that the bigger rivers, such as the Jumna, may have a similar effect. At the same time, the Lesser Florican does surmount some hill-ranges, for it migrates into the valley of Nepal, as already recorded, and it has been shot on the Nilgiris as well.

The Likh, or Lesser Florican, is not gregarious like those Bustards with which we have already dealt. In suitable country, of course, many birds may be met with in the same extent of grass-land, but they will be found at some distance apart, never in flocks, and though sometimes in pairs yet more often singly, except in the breeding-season. This little bustard, according to Jerdon, "frequents long grass in preference to any other shelter. It is, however, often to be met with in green fields, in fields of cotton and dhol, and, in the Carnatic, so much in those of the grain called *warragoo*, as to be called in Tamil, Warragoo Kolee or Warragoo Fowl."

All other writers agree with the above. Hodgson adds hill-rice to the crops they frequent, and Hume says that they are often found in millet-fields; other sportsmen have written to inform me that they have shot them out of *bajra*, Indian corn, wheat, and even young sugar-cane. Inglis also informs me that in Behar they are sometimes put up in the indigo-fields, which affords them good cover.

In fact, the Likh may be found in any crop which is dry under foot, not dense enough to make walking difficult and not too high; but, preferably, they keep to grass-land or to grain-fields into which they are tempted to feed.

Mr. Kyrle-Fellowes also records the shooting of one of these Bustards in a wooded plateau six and a-half miles from Mahableswar, in small jungle near a pool of water.

Unfortunately, the habit of the Likh during the breeding-season

of jumping into the air to attract the opposite sex has led to its undoing. All the writers quoted by Hume mention this habit and its disastrous effects, and Hume himself says: "Owing to the unsportsman-like manner in which these beautiful birds are massacred during the breeding-season, they are everywhere diminishing in numbers, and will, in another half-a-century, be, I fear, almost extinct."

Mr. J. Davidson also recorded that year by year he noticed a diminution in their numbers in the Deccan. They are not yet extinct, nor have their numbers decreased to the extent Hume feared; but there can be no doubt that everywhere the Lesser Florican is less common now-a-days than it was when Hume wrote in 1879, over forty years ago.

Davidson, describing the way in which they are killed, writes:—

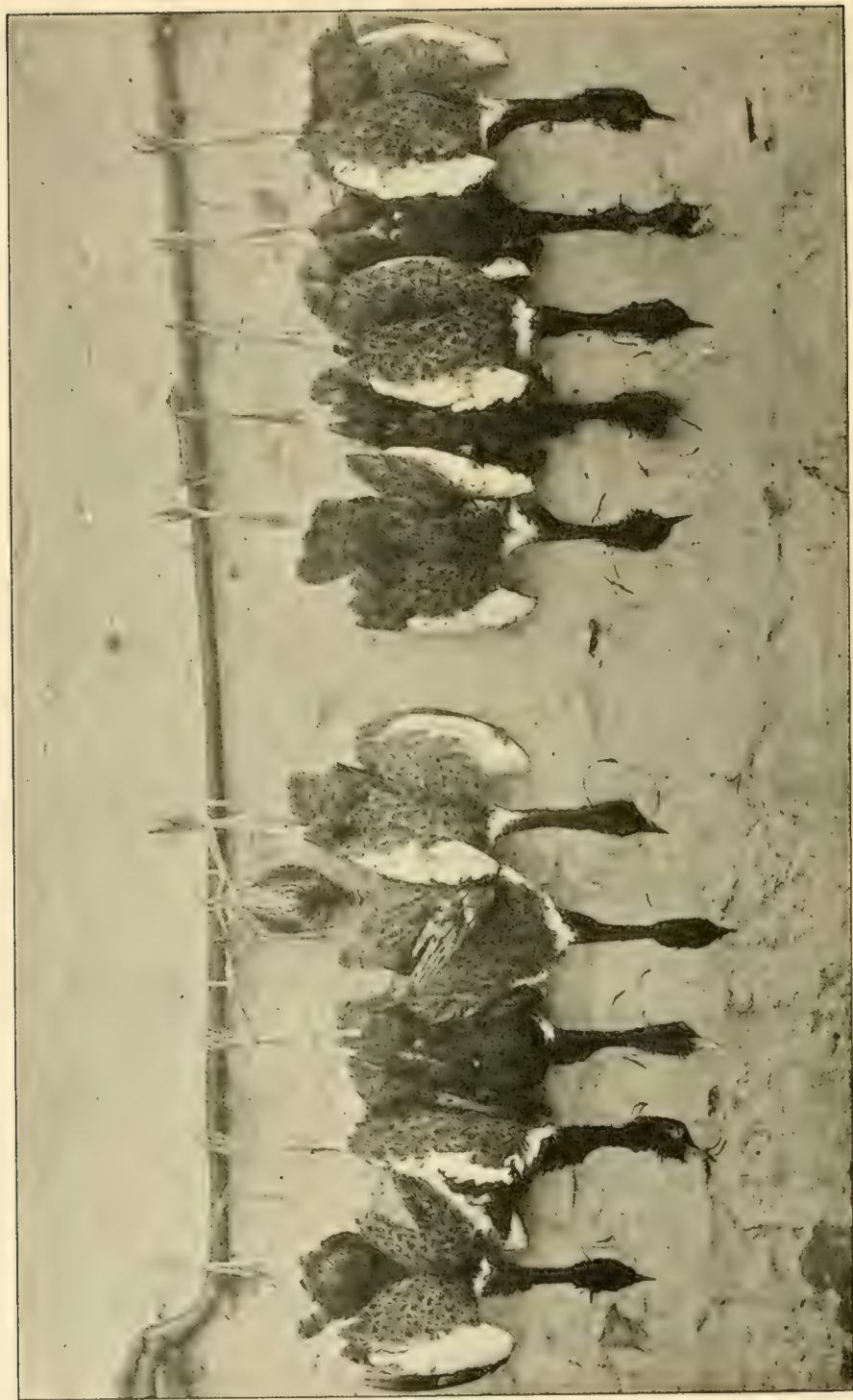
"Florican are found sparingly in Mysore; but I only saw one on two occasions in the Tumbur district during last year. It is a migrant during the rains to Western Guzerat, where it is remorselessly shot down while breeding; but apparently avoids the Panch Mahals almost entirely. At least, only one specimen has been secured there during the last few years.

"They are ordinarily shot in the Deccan in the long grass *bhirs*, being flushed by a line of beaters—the guns walking along with the beaters. In the breeding-season the cocks are sometimes shot in the following way: in the early morning the gunner—for one can hardly call him a sportsman—goes to a *bhir* where he knows there are birds, and waits till he sees one jump up in the grass and cry. He then stalks within fifty or sixty yards, and again waits till the bird jumps, and then runs as fast as he can towards the spot. The bird generally rises thirty or forty yards off, and there is a fair amount of excitement, if not of sport, in shooting them in this way."

Captain Butler gives a similar description as follows:—

"For my part, I have always protested against the wholesale destruction of these fine birds in the breeding-season, and tried very hard when I was in Deesa to persuade sportsmen (!) to spare the hens. But it was of no use; they argued that "if they did not shoot them someone else would," and consequently the Florican was shown no mercy.

"The usual method of shooting them is to walk them up in line, when they rise usually within easy shot. They are easily killed, and I have seen longer shots made at Florican than any other bird I know. In fact they drop if you fire at them at almost any possible distance (provided, of course, you hold the gun straight). At times,



A BAG OF LESSER FLORICAN OR LIKH (*Sypheotis aurita*).

however, after being marked down, they are very difficult to find, as they commence running the moment they alight, and often get 200 or 300 yards away before you reach the spot where you have marked them down. But for this, scarcely a bird would escape."

Again, Mr. James says:—

"The ordinary way in which a single gun pursues Florican is to walk through the grass, with a few beaters, listening for the cry of the bird and following it; in this way the bird can be tracked for a considerable distance. Before very long the bird will be seen jumping up above the long grass, as some think to pick grasshoppers off the stems. The best way then is to run as hard as possible up to the place when the bird will rise. They drop very easily to shot, but when once flushed are difficult to flush again."

All writers and sportsmen seem to concur in considering the Lesser Florican to be much less wild in its nature than any other Bustard, and when in fairly high grass or crops it often lies very close, not rising until the line of beaters approaches within a few yards of it and seldom rising more than thirty yards in front of the line. Jerdon says that, "it feeds chiefly in the morning and is then easily raised, but during the heat of the day it lies very close and is often flushed with difficulty. I have known one instance of one being killed by a horse stepping on it."

As might be expected the Likh is rather a favourite bird with falconers; its habitat, its powers of flight, and the ease and frequency with which it is found all combining towards this. Jerdon writes:—

"Its pursuit is consequently a favourite sport, and from the open nature of the ground it frequents, it is well adapted for being hawked. I have killed it occasionally with the *Lugger*, but generally with the *Shaheen*, but have already given an account of the manner of hunting it. Should the *Shaheen* miss her first stoop, I have seen the *Florikin* accelerate its speed so greatly, that the falcon was unable to come up with it again under 600 yards or so. I have seen one struck dead by the *Wokhab* (*Aquila vindhiana*). I had slipped a *Lugge* at it, which was in hot pursuit, though at some little distance behind, when two of these eagles came down from a vast height, and joined in the chase. One of them made a headlong swoop at it, which the *Florikin* most skilfully avoided, only, however, to fall a victim to the talons of the other, which stooped almost immediately after its confederate, and dashed the poor bird lifeless to the ground. It had not, however, time to pick it up, for I rode up, and the eagles soared off most unwillingly,

and circled in the air long above me. The *Florikin* had its back laid open the whole length." (*Jerdon's Ill. Ind. Orn. l.c.*)

It would seem a favourite prey of wild as well as tame falcons and eagles, for Hume also says that one of the very few specimens he obtained in the Etawah district was killed by a Bonelli's eagle after he had flushed it.

The flight of *Sypheotis aurita* is much like that of other bustards, but the wing-strokes are rather quicker. Blanford says: "It flies well, with a quicker flight than other bustards, having, when flying, a slight but peculiar resemblance to a duck." By "quicker flight," Blanford probably refers to a quicker wing-movement and not actually to a faster flight, for the flight of the Likh is certainly not as fast as that of the bigger birds of this family.

When flushed it often flies a considerable distance, and is then very hard to put up again, as it either squats close, allowing a line of beaters to pass over it, or it runs to a great distance and eventually rises far from where it was seen to alight. It is very strong on the leg and makes it way through thin grass or scrub-jungle at an almost incredible rate, far faster than a sportsman can walk. Jerdon notes that "when walking or running it raises its tail, as is represented in the drawing, the lateral feathers diverging downwards, whilst those of the centre are most elevated, as is seen in domestic fowls, etc., forming what Swainson calls an erect or compressed tail."

The voice of the Lesser Florican during the breeding-season is said to be a harsh croak, this being indulged in by the bird during its nuptial flights. The voice of the hen at this time is described by Wendon as "a low, clucking cry," but whether this differs from that of the male or not he does not say. According to Jerdon, "it is said to have a feeble plaintive chirp or piping note when running or feeding," and he also says that, "when flushed it utters a kind of sharp quirk or note of alarm." A personal friend of mine, who has spent much time watching these birds, gives them credit for a rather large vocabulary. He remarks *in epistolâ* :—

"These Floricans have many notes besides the drum or croak they give vent to in the breeding-season. When moving about feeding they constantly utter a low chuckle and also the chirp or piping note referred to by Jerdon. Males and females also call to one another in a croak like that just mentioned, but softer and lower."

The Lesser Florican not only suffers from the so-called sportsman who persistently shoots it throughout the breeding season, but it is also much persecuted by native snarers and bird-catchers wherever and whenever it appears. Colonel Fenton writes to me that he never came across these bird-catchers in Kathiawar, but that in the Deccan "the *phansi pardees* or professional snarers never gave the birds any rest, and it is not surprising if they have diminished of late years." Mr. James records the same in Hume and Marshall, in which work he is quoted as saying, "*Pardis*, the professional poachers of the Deccan, snare them along with partridges and quail, simply by setting a rope of snares down the grassy bank of a dry nullah and then beating the bushes."

The principal food of the Likh consists of grasshoppers, and in catching these and other insects it often hops into the air after them, catching them on the wing. No insect comes amiss to it, and it will feed freely on cantharides, beetles of all kinds, worms, centipedes, and even, when hard pressed, small lizards, frogs, etc. It is also largely a vegetable-feeder, eating both ripe grain and tender shoots of young crops and grasses, as well as many kinds of berries and young herbs.

Its flesh is generally held to be excellent, though Hume says it is not as good as that of its larger first cousin, the Bengal Florican, and compares its flesh to that of the blue pigeon. The food it eats naturally affects its eating qualities and one sportsman may eat it at one season of the year and find it almost unpalatable, whilst another, a little later, may find it just the reverse. Jerdon thought that, "its flesh is very delicate and of excellent flavour and it is the most esteemed of all the game-birds." Mr. James writes, *vide* Hume, "It is perfectly true that sometimes the effects caused by eating floricans' flesh after they have been feeding on blister-flies is most painful and disagreeable. I myself have suffered from this cause."

The two photographic plates of the Florican and the one of the Houbara are from photographs taken by H. H. the Maharas of Cutch, a sportsman with an intimate acquaintance with these birds and their habits and one who has supplied me with many interesting details regarding them.

SYPHEOTIS BENGALENSIS.

THE BENGAL FLORICAN.

Otis bengalensis, *Gm. Syst. Nat.* i, p. 724 (1788); *Hodgson, J. A. S. B.* xvi, p. 883.

Otis deliciosa, *Gray & Hardw. Ind. Zool.* i, pp. 61 and 62.

Sypheotides bengalensis, *Blyth, Cat.* p. 258; *Jerdon, B. of Ind.* iii, p. 616; *Godwin-Austin, J. A. S. B.* xiv, Part 2, p. 84.

Sypheotis bengalensis, *Hume, Nests & Eggs*, p. 559; *Hume & Marsh. Game-B.* i, p. 23, iii, p. 424; *Hume, Cat.* No. 838; *S. F.* viii, p. 111; *ibid.* ix, p. 199; *Markham, ibid.*; *Fasson, ibid.* p. 200; *Butler, ibid.* x, p. 162; *Hume & Cripps, ibid.* xi, p. 312; *Oates in Hume's Nests & Eggs*, 2nd Edit. iii, p. 378; *Finn, In. Waders*, p. 123; *Inglis, J. B. N. H. S.* xiv, p. 766; *id. ibid.* xvi, p. 73; *Wall, ibid.* xvi, p. 388; *Stuart Baker, ibid.* xvii, p. 538; *id. ibid.* xxi, p. 1109 (1912); *Stevens, ibid.* xxiii, p. 725 (1914); *G. O. Allen, ibid.* xxvi, p. 673 (1919).

Houbaropsis bengalensis, *Sharpe, Cat. B. M.* xxiii, p. 315; *id. Hand-L.* i, p. 175; *Oates, Cat. Eggs B. M.* i, p. 88; *id. Game-B.* i, p. 414.

Vernacular Names. *Charas, Chars, Charat*, H.; *Dahar, Ablak* ♂, *Bor* ♀, Terai; *Ulamora*, Assamese; *Dao-tiriling*, Cachari.

Description. **Adult Male.**—Whole head, neck and lower parts very glossy black, in some lights showing a distinct blue or purplish sheen, more especially on the feathers of the breast and crest. Back black, each feather with two broad bars of buff mottled with black, the general appearance of the back being thus a mottled black and buff, the former predominating. The bases of the feathers are black, and in quite freshly-plumaged birds there is a narrow buff fringe to the tips of the feathers, which, however, soon gets abraded so that the tips generally appear black. Inner scapulars like the back, but the mottlings are even more irregular; the centres to the feathers are chiefly black and the surrounding portions vermiculated buff and black. Tail, four centre feathers like the back, but the outermost are entirely black with narrow white tips, and the intermediate feathers grade from one to the other. Outer scapulars black, a few of the feathers more or less mottled with buff on the inner webs, inner secondaries like the back, but with numerous bars of black, not



THE BENGAL FLORICAN

Sypheotus bengalensis

female

male juv

imm.

male

always the same in number; remaining quills white, except the outer webs and part of the inner webs of the first and second primary, which are black; in some birds the outer web of the third primary is also nearly all black, and this black diminishes in extent on each succeeding quill, remaining only as a black tip to the outer webs of the innermost primaries and disappearing altogether on the outer secondaries. The shafts of all the wing-quills are black,

Colours of Soft Parts.—Bill, upper mandible dark-brown, sometimes with a leaden tinge, lower mandible paler and more leaden, and often with a yellow tinge on the basal two-thirds. Iris brown, Hume says sometimes yellow. Legs straw-yellow, sometimes with a tinge of green or plumbeous.

Measurements.—Wing 13·2 to 13·75 inches (= 338 to 347 mm.), bill, from feathers above nostril on culmen, 1·2 to 1·25 (= 30·5 to 31·7 mm.), from gape 2·12 to 2·44 (= 53·8 to 61·4 mm.), tarsus about 5 (= 127 mm.) or a little over; tail 6·5 to 7·25 (= 165 to 184 mm.).

Tarsus 5·6 inches. (*Blanford.*)

Tarsus 6·12 to 6·75 inches. (*Hume.*)

The feathers of the crest are long and somewhat lanceolate and measure from three to four inches or even more. The feathers of the hind-neck average about two inches, and below the neck they increase gradually in length from the tiny feathers of the chin to feathers on the fore-neck of over three inches and to the final tuft of feathers on the breast, which may be as long as six inches in old, fully-plumaged birds.

In some birds which are more than usually richly coloured there is often a rufescent shade in the buff-colour on the upper parts.

Adult Female and Male in First Plumage.—Crown dark-brown, sometimes almost black, with a certain amount of buff speckling and buff edges to the posterior feathers; a broad coronal streak of mottled brown and buff; supercilia and lores buff, generally immaculate but the former sometimes with a few dark specks, feathers of short crest buff speckled with black or brown and with dark centres and shafts. Chin, upper throat and centre of lower throat buff or sand-colour, unspotted, remainder of neck sandy-buff freckled and narrowly barred with black or brown, the bars not being definite enough to make

the neck look more than freckled. Down each side of the neck the feathers are centred with dark streaks, making two fairly definite lines which coalesce on the neck adjoining the breast; the feathers of this part seem often to be a richer shade of buff than elsewhere on the plumage. The back, scapulars and inner secondaries are black, mottled and freckled with buff except in the centre of each feather, and with broad subedges of buff in a V-shape. On the secondaries and outer scapulars the markings are bolder, and the black assumes the shape of fairly definite bars. Wing-coverts pale buff with a rufous tint here and there, and with sparse markings in the form of broken bars of black or deep-brown, not numerous enough or regular enough to break the general contrast of these pale-buff feathers with the plumage of the back. Remainder of wing-quills black, the outermost feather with a faint suggestion only of mottled bars of buff on the inner web, these increasing in extent until the whole of the inner secondaries are mottled black and buff. Rump like the back but less broken with buff, tail mottled black or brown and buff, the mottling decreasing in extent on the outer tail-feathers which are fairly distinctly barred with broken black and buff. Upper breast and edge of flanks buff speckled with black or brown like the neck; flanks, where covered by wing, mottled with black; remainder of lower parts pale, sandy-buff, often slightly darker on the under tail-coverts which are sometimes speckled with dark brown.

Colours of Soft Parts.—Irides yellow, dingy to almost golden, bill like that of the male but paler and often fleshy towards the base of the lower mandible, legs dingy-yellow or straw-colour.

Measurements.—Wing 13·2 to 14·50 inches (= 338·2 to 368·3 mm.), bill at front 1·50 to 1·54 (= 38·1 to 39·1 mm.), and from gape 2·2 to 2·5 (= 55·8 to 63·5 mm.), tarsus 5·6 (= 142·2 mm.) or over, tail 6·5 to 7·25 (= 163·1 to 184·1 mm.).

The measurements given above for males and females, which are taken from a series of fourteen males and eleven females, all fully adult, would seem to show that the female is very little larger than the male, but this is not really the case, as she is a far heavier and more bulky bird. I have two records of exceptionally heavy cocks, one shot by Mr. Mundy in Dibrugarh, Assam, and another by

Mr. J. Harrison, of the same district, which both weighed between $3\frac{1}{2}$ and $3\frac{3}{4}$ lbs. Most males, however, are less than 3 lbs. in weight, young cocks of the year seldom exceeding $2\frac{1}{2}$ lbs. Females, on the contrary, run up to 5 lbs., a weight which has been recorded by Mr. A. Primrose and others; they often exceed 4 lbs., and even females of the first year seldom weigh less than $3\frac{1}{2}$ lbs.

Young Male.—The young male is at first like the female, and commences to assume the adult male plumage in the second year, that is on its first spring moult, but probably often reverts, more or less, to female plumage on its autumn moult, retaining, however, the white wing-coverts of the adult male.

The complete adult plumage of the male is assumed in the most irregular manner, and at the first spring moult the young cock bird may assume any portion of the adult plumage, retaining elsewhere that of the female. Nearly always, however, the white wing-feathers are amongst the earliest to show themselves.

Some young birds first moult into the adult black plumage from the breast downwards, having this part wholly glossy black, although, with the exception of the wings, the rest of the body remains clothed in a female garb. Other young males retain their first feathering on the upper parts, but commence to assume the black feathers of the throat as well as those of the lower parts in a lesser degree. One such specimen I have examined has the whole of the upper parts in juvenile plumage, with the exception of a few white feathers amongst the wing-coverts; below, from the chin to the breast, the black feathers are growing profusely, though there are still a few feathers here and there retaining their original vermiculated appearance; from the lower breast downwards the whole lower plumage is a soiled white, with a good many black feathers showing all over as well as a few vermiculated ones.

This young bird is a most interesting one, as it would appear that sometimes, whilst the upper breast, neck, head and upper parts assume the adult plumage directly, though by varying degrees, the plumage of the lower parts goes through a transition stage. The whole of the buff in the bird has been replaced with white, though there are a few of the adult black feathers already showing.

The question as to whether the Florican has a separate breeding-

plumage, and changes back again during the autumn moult into a non-breeding or post-nuptial plumage may, I think, be now decided to the contrary.

Blyth is responsible for the generally accepted theory that the cock bird changed into a semi-female plumage in autumn, which it regained in the succeeding spring, and doubtless he had then a good deal of information before him on which to ground his arguments. Blyth writes :—

“Mr. Hodgson is also certainly mistaken in his assertion that the nuptial dress is worn permanently, as we have witnessed the change before described, and the subsequent partial renewal of the breeding-livery, which latter was not well developed in captivity, and have likewise observed the fact in the skins of wild birds.”

Hodgson, on the other hand, says :—

“The moults are two annually, one from March to May and the other autumnal, which is less complete and more speedily got over, between August and October. The young males, up to the beginning of March, entirely resemble the females, but the moult then commencing gradually assimilates them to the adults, which never lose, as the lesser species or Likh does, after the courting season, the striking black and white garb that in both species is proper to the male sex, and permanently so to the larger species after the first year of age. There is, properly speaking, no nuptial dress in this species, though the hackles and crest in their most entire fulness of dimensions may be in part regarded as such.”

Now this statement of Hodgson's seems to be entirely correct, except as regards one important particular. He considers, as we have seen, that the Florican assumes adult plumage in two moults, or even in one, and that after the *first* year the young bird retains permanently its adult colouration ; I would change first year to second year.

We know now that just as many fully-plumaged adult males are seen during the cold weather, say from November to the end of February, as at any other time of the year. I have seen magnificent specimens of cocks moulting in April from adult plumage to adult plumage. But, on the other hand, I have several times seen *non-adult* cock birds, which were in an intermediate stage, remoulting in autumn

and showing some new feathers coloured as in the female. From this we may, I think, infer that it takes the young cock at least two years before it assumes the full plumage of the breeding cock. It will be seen that Blyth does not say that his Floricans, after having a retrograde moult, then moulted in the succeeding moult into full feathering, but he puts down this failure to assume the fully adult garb to the effects of captivity. The facts, in reference to the assumption of the fully adult plumage, appear to be these. In the autumn moult of its first year the young male bird retains its female plumage, but in the succeeding spring moult acquires a colouration intermediate between the two sexes. The autumn moult of the second year may often see the young cock lose a certain amount of the colouring he had gained in the spring, but at the next spring moult he goes further still towards the plumage of the adult, and on the completion of this moult, when he is just under two years old, he either obtains the adult plumage in full or else he does so at the second yearly moult in the autumn. From this time onwards there is no further retrograde step. Of course, I have seen very many cocks in the winter in either wholly female or half-stage feathering, but these have been small birds which, though they were sometimes very fat and in prime condition, never weighed more than 2 to $2\frac{1}{2}$ lbs. There is no doubt that a cock Florican takes at least two years to grow to his greatest size and weight, and it is but natural that his dress should keep pace with his growth, and that he should not arrive at his full splendour of plumage until he also arrives at his full vigour and size.

Distribution.—Although so many years have passed since Hume described the habitat of the Florican, there is but little to add to his account. He says :—

“ The Bengal Florican is almost confined to Eastern Bengal, the valley of Assam, the Bhutan Dooars, and those portions of Bengal, Oudh and the North-Western Provinces lying north of the Ganges. Jerdon says that it spreads through the valley of the Jumna into Rajputana, the Cis-Sutlej States, and parts of the Punjab; but this is wrong. It is the Houbara that is found in these localities, not the Bengal Florican; but sportsmen constantly call the Houbara the Florican, and hence the mistake. I have never seen the true Florican anywhere west of the Kadar of the Ganges, except as a rare straggler in the Dun; and there again it does not, to the best of my

belief, extend further than the Kadar of the Jumna. In Meerut I have killed both the Houbara and the Likh; but it is only when you get quite down into the Kadar of the Ganges at Hastinapur and Makhdumpur, or, again, southwards below Garhmuktesar, that you meet the true Florican, and here we used to pick up a few couples every cold season.

"This species has been recorded from Tipperah and Sylhet; but Capt. Williamson tells me he has never seen it in the latter, and both he and Mr. Inglis say the same as regards Cachar.

"This Florican is essentially Indian, and extends, so far as we know, nowhere beyond the limits of the Empire. It is *possible*, however, that it may hereafter be found to occur in the country immediately east of Assam."

To this, in a footnote, Hume adds that it is certainly to be found as far west as Nuddea.

Roughly speaking, this beautiful bustard is confined to the grass-land area north and east of the Ganges and on either side of the Brahmapootra; outside of this it is but a straggler. My furthest record south-east is from the district of Chittagong; whilst in the Assam Valley it extends to the extreme eastern limit of the grass-lands and churs bordering the Dihong, Dibong and Brahmapootra Rivers, running right up to the very foot of the hills, both to east and north. It is found in the Terai in some numbers, wherever the country is suitable; and in the same way throughout the Dooars, south of Nepal and Bhutan. In Assam it is common in many districts and extends all through the Assam Valley from Rungpur and Goalpara to Dibrugarh. From the Surma Valley it is shut out by the Garo, Cachar and Khasia Hills; and though it is common in parts of Nowgong to the north of these ranges, it is of extreme rarity anywhere to the south of them. I have shot three birds, all young females, in Cachar, and have seen two specimens from Sylhet. Hume records it from Tippera in 1902, and, finally, I have received a specimen from Chittagong. But these few instances are scattered over a period of over twenty-five years, and merely emphasize the fact of its great rarity south of the Brahmapootra Valley.

As Colonel Graham gave such a detailed account of the numbers in which the Florican was to be found in former times in each Assam district, it may be as well here to give also an idea as to how it is now distributed. Colonel Graham writes;—

"The Bengal Florican may be said to extend throughout the Assam Valley from the Manas River on the west to the Mishmi Hills east of Sadiya, on the east.

"It is found in greatest numbers in high and dry open lands; the places most frequented by it being the large Bishnath Plain and the higher lands lying between the Government Trunk Road on the north of Brahmapootra, and the hills throughout the Darrang districts.

"North of Mangaldai, in Darrang, about five miles from the Bhutan Hills, at a staging bungalow well-named Shikar, I shot fourteen Florican in one day.

"The Florican is also found on the Sadiya Plains in fair numbers, and on the churs of the Brahmapootra; but it is much scarcer on the south bank of that river.

"On the Bishnath Plain and other places in the Darrang district, I have seen, I am sure, from thirty to forty Florican in a day.

"Taking Assam as a whole, I should say of the Florican:—

"In Darrang, very common.

"In Kamrup and Goalpara, a good sprinkling.

"In Nowgong, Sibsagar, Lakhimpur, here and there a fair sprinkling; but, as a rule, scarce."

At the present day the Florican is still plentiful in the Goalpara district on the north bank, breeding in great numbers in the sun-grass lands at the foot of the Bhutan Hills; from this district it extends through Kamrup, Mangaldai, Darrang and Sibsagar, north of the Brahmapootra, in considerable numbers wherever there are the necessary plains of grass to be found. In North Lakhimpur it becomes less common, though it will be found right up to the foot of the Abor, Mishmi and Daffa Hills, east and north of Sadiya. South of the Brahmapootra River, though it is common in parts of Nowgong, it is elsewhere rare. In Lakhimpur and Sibsagar a fair number are shot annually south of the river; but in Kamrup and Goalpara it is decidedly rare on that bank of the Brahmapootra, and it hardly ever straggles to the district of Mymensingh—which adjoins the latter—though it is common in parts of the Rangpur district to the north of the river. I should, however, note that Farren recorded it as occurring not infrequently along the borders of the Madhapore jungle in 1880.

Both in Maldah and Purnea, where twenty-five years ago it was common, it has now become much less so, principally owing to the

spread of cultivation and the consequent destruction of its favourite haunts. In Nuddea it is not now heard of, and the last killed there was by myself, this, too, a female, in January, 1884.

In Behar it only occurs as a very rare straggler. Inglis, who has worked this part of India very thoroughly, only records five instances of its occurrence, and, of these two probably refer to the same bird.

Nidification.—The breeding-season of the Florican commences in March and extends into June, but the majority of eggs are laid in the first fortnight of April or in the last week of March.

The cock Florican, like all the rest of his family, goes in for all sorts of curious antics during the breeding season. Hodgson, as quoted by Hume, writes:—

“The Florican is neither polygamous nor monogamous, nor migratory nor solitary. These birds dwell permanently and always breed in the districts they frequent, and they dwell also socially, but with a rigorous separation of the sexes, such as I fancy is paralleled in no other species. Four to eight are always found in the same vicinity, though seldom very close together, and the males are invariably and entirely apart from the females after they have grown up. Even in the season of love, the intercourse of the sexes amongst adults is quite transitory, and is conducted without any of that jealousy and pugnacity which so eminently distinguish most birds at that period.

“In the season of love, the troops of males and females come into the same neighbourhood, but without mixing. A male that is amorously disposed steps forth, and by a variety of very singular proceedings, quite analogous to human singing and dancing, recommends himself to the neighbouring bevy of females. He rises perpendicularly in the air, humming in a deep peculiar tone and flapping his wings. He lets himself sink after he has risen some fifteen or twenty yards, and again he rises and again falls in the same manner, and with the same strange utterance, and thus perhaps five or six times, when one of the females steps forward and with her he commences a courtship in the manner of a turkey-cock, by trailing his wings and raising and spreading his tail, humming all the time as before.

“When thus, with what I must call song and dance, the rites of Hymen have been duly performed, the male retires to his company and the female to hers: nor is there any appearance (I have at some cost had the birds watched most closely) of further or more enduring intimacy between the sexes than that just recorded, nor any evidence that the male ever lends his aid to the female in the tasks of incubation and rearing the young.

"The procreative instinct having been satisfied, the female retires into deep grass cover, and there, at the root of a thick tuft of grass, with very little semblance of a nest, she deposits two eggs, never more or less, unless the first be destroyed. If the eggs be handled in her absence, she is sure to discover it and to destroy them herself. The eggs are of the size and shape of an ordinary domestic fowl's, but one generally larger and more richly coloured than the other.

"The female sits on her eggs about a month, and the young can follow her very soon after they chip the egg. In a month they are able to fly; and they remain with the mother for nearly a year, or till the procreative impulse again is felt by her, when she drives off the long since fully-grown young. Two females commonly breed near each other, whether for company or mutual aid and help; and thus the coveys—so to speak, though they are not literally such—are usually found to consist of four to six birds. The Florican breeds but once a year in June—July, that is, the eggs are then laid, and the young hatched in July—August."

Captain C. B. Macgregor also describes their dance as follows :—

"In June and July, and sometimes as late as August, I have repeatedly witnessed the performance of the nuptial dance by the cock bird in full plumage. The bird rises from the ground and hovers with extended wings from ten to twenty feet in the air, and thus attracts the female birds who may be within an easy distance. Twice I have noticed this dance in the evening after the sun has gone down when returning from shooting under the Daphla hills. The Florican generally breeds in the higher plateaux of the Assam valley, near the foot of the hills. The males have been seen also by Major Cock in full plumage in the month of May."

Mr. Primrose, also, in writing to me, remarks :—

"The male bird makes itself very conspicuous during the breeding-season from its habit of rising a few feet into the air above the grass and, after hovering a few seconds with quivering wings, again dropping to earth. Whilst thus employed the birds are so taken up with their performance that they are very easily approached and the native pot-hunters take full advantage of them at this season."

The first clutch of eggs I ever took with my own hands was found for me by a Mikir, and shown to me on the 3rd June, 1904. These two eggs were laid in a bare patch in an extensive field of sun-grass close to a village, the cattle and buffaloes from which had regularly fed over it. In consequence, the grass was neither very high nor very dense and was intersected in every direction by small paths,

worn by the animals as they fed. These two eggs were taken at Sadiya in the Dibrugarh district and I heard of two other clutches being found by sportsmen in that district, one in March and the other in July.

In 1906 and the following years I employed a large number of men to work the Terai land at the foot of the Himalayas in the Goalpara and Mangaldai districts and succeeded eventually in obtaining a very fine series of eggs, and in all over ninety have now passed through my hands.

The result of this work shows beyond all doubt that the normal breeding-season of the Florican is much earlier than has hitherto been thought to be the case. The months in which the vast majority of eggs are laid are March and April, and it may be said that the height of the laying-season is from the 10th March to the 15th April. Some few birds will, however, be found to be laying in May and yet a few others as late as June, but in this latter case I fancy the clutches are second layings in place of others which have been taken or destroyed.

Messrs. Shillingford, Whymper and others, have certainly taken their eggs in June, and the latter assures me that he believes that June is the normal laying-month for Florican in the north-western Nepal Terai. All these gentlemen have, however, taken but a casual nest here and there, and I still consider the weight of evidence points to the Florican being an early breeder.

The following are the dates on which I have taken, or had taken, or seen *in situ* Florican's eggs:—

28th February.	Two eggs, quite fresh.
3rd March.	One egg, quite fresh.
6th ,,	Two eggs, quite fresh.
7th ,,	Two pairs of eggs, fresh.
14th ,,	One pair, slightly incubated.
16th ,,	One egg, hard set (about twenty days).
19th ,,	Two pairs, one fresh, one hard set.
24th ,,	Two pairs, both fresh.
25th ,,	One pair, fresh.
28th ,,	One pair, fresh.
29th ,,	Three pairs, two slightly incubated, one fresh.
30th ,,	One pair, slightly incubated.
3rd April.	One pair, fresh.

5th April.	One pair, fresh.
7th „	Two pairs, one slightly, the other much incubated.
9th „	Two pairs, both considerably incubated.
10th „	One pair, fresh.
11th „	One pair, incubated.
13th „	Three pairs, one considerably, the other two slightly incubated.
16th „	Two pairs, hard set.
19th „	One pair, would have hatched in three days or so.
22nd „	One pair, slightly set.
23rd „	A single egg, much incubated.
27th „	Two pairs, slightly incubated.
28th „	One pair, set.
29th „	A single egg, fresh.
30th „	A single egg, almost fresh.
5th May.	A pair, fresh.
13th „	A pair, hard-set.
14th „	A pair, hard-set.
20th „	Two pairs, one slightly, the other considerably incubated.
25th „	A single egg, hard-set.
31st „	One pair, hard-set.
3rd June.	One pair, fresh.
5th „	One pair, fresh.
16th „	Two pairs, fresh.
24th „	One pair (not taken away).
3rd July.	Four eggs, close together, not taken.

Thus, of the eighty-five eggs recorded it will be seen that they were found as follows:—

In February, 2	In April, 35	In June, 8
In March, 24	In May, 13	In July, 4

The four eggs seen in July were in some grass-land which had been flooded and were actually under water when found, so that they must have been laid some time in the middle of June at latest. The gentleman who found them was after tiger at the time and did not remove them.

In every case the eggs had been laid on the ground in small bare patches in the centre of fields of sun-grass, or *uloo* grass, these being generally of considerable extent, seldom near any village or habitation, and most of them surrounded by dense forests or cane jungle.

The eggs are exceptionally difficult to find owing both to the great extent of country one has to cover and to the natural cuteness

of the hen bird. Unless taken absolutely unawares by the searcher she never rises direct from her nesting-place when disturbed, but creeps through the grass until she has got a considerable distance from it, after which she rises and flies straight away. Thus, one can never hope to find the eggs within fifty yards of where she is flushed, and often they may be 200 yards from this spot. She exhibits the same care in approaching her eggs, alighting a hundred yards away and walking through the jungle up to them. Fortunately, the bird when disturbed generally makes off in a bee-line from the object disturbing her, so that the egg-collector, marking the spot whence she rises, generally finds the eggs by working back in a straight line towards the direction whence he has come.

An Indian friend who was so kind as to look after my collectors for me and to collate notes on the birds' breeding habits, wrote to me as follows about this bustard :—

“A Florican lays only two eggs a year in the breeding-season (April and May). Dense forests infested with ferocious animals, scarcely trodden by men, are the places where eggs are laid on the ground. The bird takes great precautions to conceal her eggs, and you can hardly find any eggs within a quarter of a mile from the place where a Florican is seen. She creeps through the forest unobserved to a great distance to lay her eggs. A very careful and extensive search is required to discover them.”

Nest there is none, and the eggs are merely laid in some natural depression under shelter of a tussock of grass. Where there is no such convenient hollow the bird scratches one in the soil or lays them on the ground without taking even this much trouble.

The number laid is almost invariably two, though sometimes a single egg may be incubated. It is practically certain that neither three nor four eggs are ever laid by one bird, and the frequent stories recorded to this effect are groundless. It is very noticeable that of the two eggs laid incubation is generally far more advanced in one than the other, and they would appear to be laid at an interval of several days. My own collectors told me that when they found a single egg laid they often waited three to five days before the second was deposited.

Incubation would seem to take about twenty-five to twenty-seven days, though this is only guess-work. A pair found on the 5th May,

and which, when tested in lukewarm water, proved to be fresh, were eventually hatched on the 30th of that month and 2nd June, though neither chick survived more than a few hours.

In shape the eggs are typically very regular ovals, the ends being equal. In proportion of length to breadth they vary considerably, but remarkably little otherwise, though a few eggs may be somewhat pointed at one end and in a few other instances at both ends. Curiously enough the extremes of variations are often met with in pairs of eggs laid by the same bird.

In colouration this bird's egg is peculiarly constant, unlike the eggs of *Sypheotis aurita* (the Lesser Florican) which vary very greatly *inter se*. The ground-colour is an olive-green, in some cases rather brighter, in some rather more brown. The very few exceptions to this ground-colour in my collection are one pair with a pale olive-green, almost sea-green tint, and another pair with a pale stone-grey colour.

The markings consist of small freckles, splashes and blotches, generally longitudinal in character, of brown and purple-brown, rather more profuse at the larger end than elsewhere, but nowhere very numerous. In some eggs these markings are all reduced to freckles, and in these eggs they are often very numerous, very indefinite, and often equally distributed over the whole surface. In no eggs are the markings at all bold in character. In a few eggs, not, I think, one in ten, there are a few secondary markings of purple-grey or dark lavender-grey, but they are very indistinct, and, from the colour of the ground, hard to distinguish.

The average of eighty eggs is 2.42×1.76 inches (= about 62.5 mm. $\times$ 44.8 mm.), and the greatest length and breadth 2.76 and 1.85 (= about 70 mm. $\times$ 47 mm.), respectively, and the smallest 2.28 and 1.67 (= 57.9 mm. $\times$ 42.5 mm.).

When fresh the great majority of *Sypheotis bengalensis* eggs are decidedly a bright *greenish* olive-green, but very soon after being blown they become somewhat paler, and in a year or two often lose much of their green tint and become more of an olive-brown. The gloss, also, which in newly-taken eggs is generally highly developed, pales considerably with time, though some retain it for many years and few lose it altogether.

General Habits.—The favourite haunts of the Florican are thus well described by Hodgson, who says :—

“Tarai is an Indian term equivalent to Pays Bas, Landes, Marches and Marshes, of European tongues; and the name Tarai is applied, par excellence, to a low-lying moist and rarely-redeemed tract of level waste, extending outside the Sal forest along the base of the sub-Himalayas from the debouch of the Ganges to the Brahmapootra. This tract of great extent and peculiar features is the favourite habitat of the Florican, which avoids the mountains entirely, and almost, if not quite as entirely, the arid and cultivated plains of the Doab, and of the provinces west of the Jumna. It dwells indeed, upon plains exclusively, but never upon nude or cultivated plains. Shelter of nature's furnishing is indispensable to it, and it solely inhabits wide-spreading plains, sufficiently elevated to be free from inundation, and sufficiently moist to yield a pretty copious crop of grasses, but grasses not so thick nor so high as to impede the movements or vision of a well-sized bird that is ever afoot and always sharply on the look-out. Such extensive, well-clad, yet uncultivated plains are, however, to be found only on the left bank of the Ganges, and accordingly I believe that to that bank the Florican is nearly confined, and to the Tarai portion thereof.”

I am afraid, however, that since Hodgson's days the Florican has become less wise, for he nowadays often haunts grass-land that is liable to inundation, and indeed, throughout the cold weather, he is found on the plains bordering the rivers and on the islands in them, although during the rains these may form one vast sheet of water with the river itself.

The Florican prefers to frequent plains which are covered with thin grass, or thin grass combined with scattered scrub-jungle, and much affects those tracts on which village buffalo feed and in which the grass is eaten down to some eighteen inches or two feet, with here and there patches of higher grass, and others, again, bare altogether. In the same way it haunts the plains of ekra and grass after these have been burnt and the fresh crop has grown up to a foot or so, but is still much mixed with the burnt and withered stems of the previous year's growth. It is only in the height of the rains and when no other cover is available for it that it will ever be found in the dense grass and ekra, which at these times may grow to a height of fifteen feet, nor will it even then be obtained in such

unless there is no other more suitable ground within many miles. Of course, when repeatedly shot at, birds will temporarily take refuge in such cover, and sometimes, when they are much worried by sportsmen or village pot-hunters, they will lie up in heavy cover during the heat of the day, coming out to feed in the mornings and evenings.

Mr. A. Primrose, who was for some years in Goalpara, in writing to me about the Florican, says :—

“ It has a very decided predilection for certain spots, and if you kill the present occupant another is sure to be very shortly found in the same place ; one such spot was the grazing-ground of the Mornai Tea Estate, and on this piece of land I must have accounted for fully a dozen birds and my predecessor for as many more.

“ The birds, as a rule, in grass-lands lie very close and rise generally well within shot, and as they are not what I should call good shot-carriers, No. 6 shot will be found quite large enough to crumple them up. As a matter of fact I have killed two or three—all females if I remember rightly—with collecting cartridges only loaded with No. 9 or 10 shot. When, however, the bird is found in open or burnt patches it is exceedingly wary and very hard to get right within shot.

“ The flight, when well on the wing, while not being rapid, is strong and direct.”

I have occasionally shot them when out snipe-shooting, flushing them from small patches of grass between the rice-fields, and No. 8 or 9 shot have always been enough to tumble them over ; for, though big birds, their plumage is soft and lax, and affords little protection.

When once flushed they generally fly a good distance, sometimes a mile or so, before alighting, and are then difficult to find and to flush again, as they are great runners and move on a long distance before stopping.

Hodgson says :—

“ The Florican is seldom found in thick cover. When he is, he lies close, so that you may flush him at your foot ; but in his ordinary haunts, amid the scattered tufts of more open grass plats, he can be neared with difficulty only, and No. 5 shot and a good heavy gun are required to bring him down at forty to sixty yards' distance. His flight is strong, with a frequent, rapid, even motion of

the wings, and if he be at all alarmed, it is seldom suspended under 200 to 300 yards, whilst not infrequently it is continued so as to carry the bird wholly out of sight and pursuit. When flying, the neck is extended before the body and the legs tucked up under it, whereas the whole family of the herons fly with neck retracted over the back and legs stretched out behind. The walk of the Florican, like that of the heron, is firm and stately, easy and graceful; he can move afoot with much speed, and is habitually a great pedestrian, seldom using his powerful wings, except to escape from danger, or to go to and from his feeding-ground at morn and eve, or to change it when he has exhausted a beat.

"This species is silent and tranquil, and, except in the breeding season, seldom utters a sound, but, if startled, its note is a shrill metallic chik, chik-chik, and the more ordinary note is the same, but softer and somewhat plaintive."

Mr. Primrose endorses this, and says that, on being flushed, it utters a sort of chirrup, but is otherwise silent. I have myself heard them give a sound when flushed, but should have described it rather as a croak than a chirrup; other than this and the curious humming they give when courting, I have not heard them make any sound.

They are not gregarious as are most other bustards, and one bird will seldom be found very close to another.

Colonel Macgregor says that he once put up four Florican within a radius of thirty yards, but this is unusual, and birds are seldom found within a couple of hundred yards of one another, especially where the jungle is thin and the birds can move about freely. Once when duck-shooting I saw two old cock-birds in the open within a few yards of one another, and when I sent a man round to drive them overhead he also put up a hen, and my companion and I accounted for all three. Once also I shot two hens out of a patch of grass not a hundred yards long, and once or twice I have taken two clutches of eggs laid quite close to one another.

Big bags of Florican are seldom made, though on one occasion a so-called sportsman in Assam shot sixty-four of these beautiful birds in one day during the breeding season. There had been very early and very unusually heavy rains, and, in consequence, a vast area of grass-covered plain had become temporarily submerged, and for miles in every direction there was water varying in depth from a few inches to two or three feet deep. In the centre of this was a somewhat

raised strip, and here all the birds from far and near had collected. The sportsman (?) walked from one end to another, bagged a dozen Florican, and then when the birds had again returned and settled on the dry land, walked back and killed a lot more, and this he continued to do until darkness drove him home.

Mr. Anley, writing of the Dooars, said that he had seen as many as twenty in a morning, and Mr. Damant recorded that bags of eight or ten could often be bagged in a morning at the foot of the Garo Hills.

Colonel Comber also says that in many places they are common enough in Assam for ten or more to be killed in a day's shoot.

With a line of elephants there are still many places where one could pick up a dozen birds or so in a day, but shooting on foot is laborious work, for much ground has to be covered and the grass and jungle make the walking hard. Under the latter circumstances a bag of more than four or five would be good nowadays for a single gun to get in a day's work.

It is not often, however, that a sportsman sets out to make a bag of Florican; many are killed by men out making a miscellaneous bag, but perhaps even more are killed by sportsmen on elephants returning from a day's big-game-shooting.

In my article on the breeding of the Florican which appeared in vol. xvii. of the Bombay Nat. Hist. Society's Journal, I commented on the close-time needed for the protection of this bird, and then said that it was probable that the time selected should be from the 1st March to the 1st October. This period is especially required for females, but as the male bird is promiscuous in his courtship and takes no interest in the protection of eggs or young, the period for him might be taken from the 1st March to the 1st August.

As a matter of fact, throughout the area this bird inhabits, nature puts a practical closure on all shooting in August and September, and the extension of the shooting-season for males would have no effect. It would be excellent if the shooting of females could be altogether stopped for some years to come, as there is no doubt that the Florican is one of our game-birds which has been seriously decreasing in numbers of late years.

The Plate of this bird requires little comment. The iris of the male should be deep-brown and the upper mandible should have far less yellow or none at all. The plumage of the head and neck is also unusually thick and heavy, though a few birds may have it as dense when just moulted.

The female is excellent, but the spear-shaped centres to the feathers of the back are perhaps a little too definite.

Order PTEROCLETES.

The order *Pterocletes* contains but one family, *Pteroclidæ*, and the distinguishing characteristics of the order and the family are therefore the same, and are dealt with under one head.

Family PTEROCLIDÆ.

The Sand-Grouse, or Pigeon-Grouse, as Huxley happily named them, constitute an order of one family, which come half-way between the Pigeons and Doves, *Columbæ*, and the *Gallinæ* or true Game-Birds, to which latter they are very closely allied through the real Grouse. In general external appearance they are, perhaps, more nearly like the true Grouse than any other Game-Bird, but they have also a strong resemblance to Pigeons in build, carriage of head, etc., though both feet and bill are Galline.

In the Pigeons the toes are broad and well-fitted for perching, whereas in the Sand-Grouse they are more fitted for ground-work, as in the Galline birds; the bill also has no cere, or soft skin over the basal half, as it has in the *Columbæ*. Both *Pteroclidæ* and *Columbæ* have eleven primaries and the fifth secondary wanting; whereas the *Gallinæ* have only ten primaries, but possess a fifth secondary. In all these orders the muscles of the thighs and legs are similar. The *flexor perforans digitorum* is attached to the *flexor longus hallucis* by a fibrous vinculum, the former supplying the three front toes, and the latter, as usual, the hallux, or hind-toe. The ambiens muscle is present, except in a few Pigeons. The femoro-caudal, except in Peafowl and Turkeys, the accessory femoro-caudal, the semi-tendinosus and accessory semi-tendinosus are all present, as well as both carotids, except in the Megapodes.

The keel of the sternum is very high, and there are usually two notches on each side of the posterior margin, but the inner is sometimes reduced to a foramen.

The gall-bladder is present, and the Sand-Grouse possess a nude oil-gland and their contour-feathers have after-shafts.

Palate schizognathous; nasals generally schizorhinal, but very variable; basipterygoid processes present; cervical vertebræ fifteen or sixteen.

The dorsal feather-tract has an interscapular fork, and the lateral bare tracts extend on the shoulders as far as the base of the neck.

Pigeons, of course, have their young hatched naked and singularly helpless, but the young of the Sand-Grouse are covered with richly-coloured down and are able to run, and, to some extent, feed themselves directly they leave the egg.

The tarsus is well-feathered in all the genera of this family, in one genus the feathering extending also to the toes. They are birds of swift powerful flight, with comparatively long wings.

The order contains but three genera, *Pterocles* and *Pteroclorus*, which are very closely allied, and *Syrrhaptes*, which is fairly distinct. All three genera have representatives in India, and some species are to be found in Africa, South and Central Europe, and Asia.

Most Sand-Grouse are migratory, and in all species the two sexes differ in plumage, the male bird being much the more brilliantly coloured.

Key to the Genera.

- A. A hind-toe present. Tarsus only feathered in front and toes naked.
- a.* Middle tail-feathers normal *Pterocles*.
 - b.* Middle tail-feathers pointed and longer than the others *Pteroclorus*.
- B. No hind-toe. Tarsus feathered throughout and toes also feathered *Syrhaptes*.

Ogilvie-Grant distinguishes sixteen species altogether, of which exactly half are found in India.

Genus **PTEROCLES**.

The first of our genera, *Pterocles*, is also the largest, containing, according to Sharpe and Ogilvie-Grant, ten species, of which four are found in India. Of these, one is entirely resident; but the other three are, to some extent, migratory, although they breed either close to, or actually within, the borders of the Indian continent.

The differences between *Pterocles* and *Pteroclorus* are hardly generic, consisting, as already shown, only in the elongation of the middle tail-feathers in the latter; the differences are, in fact, identical with those between *Sphenocercus sphenurus* and *Sphenocercus apicaudus* amongst the Pigeons, though these two latter have not yet been split into two genera.

Owing to further researches, it has become necessary to revise several well-known names of birds of this family; but now that the *earliest* names have been ascertained and applied there should be no more changes, and the newer generations of ornithologists and field-workers will be spared the alterations which we of the older generation have to learn. The principal changes from Blanford's Avifauna are as follows:—

<i>Pterocles arenarius</i>	=	<i>Pt. orientalis</i> .
<i>Pterocles fasciatus</i>	=	<i>Pt. indicus</i> .
<i>Pteroclorus exustus</i>	=	<i>Pt. senegalensis</i> .

Further, an examination of the immense material now available in the British Museum, Tring, &c., shows that some of the species, hitherto all lumped together under one name, vary considerably in different parts of their range, and must therefore be divided into geographical races or subspecies. These Hartert has dealt with at length in his magnificent work on 'Palæarctic Birds.'

The subspecies found in India are:—

<i>Pterocles coronatus atratus</i> .
<i>Pterocles lichtensteini arabicus</i> .
<i>Pterocles alchata caudacutus</i> .
<i>Pterocles senegalensis erlangeri</i> .

Key to the Species.

- A. Abdomen black throughout. *orientalis*.
- B. Abdomen banded black and white.
 - a*. Two dark pectoral bands.
 - a'*. No band across hind-neck *indicus* ♂.
 - b'*. Band across hind-neck *lichtensteini* ♂.
 - b*. No dark pectoral bands.
 - c'*. Chin unspotted, tarsus spotted or barred . . . *indicus* ♀.
 - d'*. Chin spotted, no spots or bars on tarsus . . . *lichtensteini* ♀.
- C. Abdomen unspotted buff in male, spotted buff in female *coronatus*.

PTEROCLES ORIENTALIS.

THE LARGE, IMPERIAL, OR BLACK-BELLIED SAND-GROUSE.

Sand-Grouse, *Lath. Gen. Syn.* ii, p. 751 (1783).

Tetrao orientalis, *Linn. S. N.* i, p. 161 (1758); *Hartert, Vog. Pal.* p. 1502 (1920).

Tetrao arenarius, *Pal. Nov. Com. Petrop.* xix, p. 418 (1775).

Pterocles arenarius, *Temminck, Man. d'Orn.* p. 300 (1815); *Gray, List B.* iii, p. 49; *Blyth. Cat.* p. 249; *Jerdon, B. I.* iii, p. 496; *Hume, S. F.* i, p. 219; *Adam, ibid.* p. 391; *Dresser, B. of E.* vii, p. 61; *James, S. F.* iii, p. 418; *Hume, ibid.* iv, p. 4; *Butler, ibid.* iv, p. 4; *Wise, ibid.* p. 230; *Blanford, E. Persia*, ii, p. 271; *Butler, S. F.* v, p. 222; *Hume & Marsh. Game-B.* i, p. 47; *Hume, S. F.* vii, p. 161; *Butler, ibid.* p. 186; *Marshall, ibid.* viii, p. 492; *Butler, Cat. B. of S.* p. 52; *Hume, Cat. No.* 799; *Tufnell, S. F.* ix, p. 200; *Barnes, ibid.* pp. 219, 458; *Reid, ibid.* x, p. 61; *Biddulph, ibid.* p. 275; *Barnes, B. of Bom.* p. 294; *id. J. B. N. H. S.* v, p. 333; *Rattray, ibid.* xii, p. 345; *C. G. Nurse, ibid.* xiv, p. 388; *S. E. Marshall, ibid.* xv, p. 353; *Nicol. Cumming, ibid.* xvii, p. 691; *Ogilvie-Grant, Cat. B. M.* xxii, p. 18; *Oates, Game-B.* i, p. 36; *Blanf. Avifauna, B.I.* iv, p. 59; *Indian Field*, 21st Feb. 1907; *Le Mess. L. and W. B. of In.* p. 56; *Whitehead, J. B. N. H. S.* xx, p. 967; *Stuart Baker, ibid.* xxi, p. 3; *Stirling, ibid.* xxiii, p. 159; *Delmé-Radcliffe, ibid.* xxiv, p. 161 (1915).

Pteraclis arenarius, *Sharpe, Hand-L.* i, p. 50; *Oates, Cat. Eggs, B. M.* i, p. 86.

Vernacular Names. *Bhat-titūr, Bakht, Bakhy-titūr*, Hin.; *Banchur, Kurmor*, Peshawar; *Burra Bhatta*, Hariana; *Siya-sinah*, Persian; *Katinga*, Sind; *Katarr*, Arabic.

Description. Adult Male.—Head above, neck and upper back grey tinged with russet, except round the eye, where the grey is more pure; chin, upper throat, sides of the face and neck chestnut, extending as a collar round the neck, except in the centre where it pales into orange and finally merges into the grey; a triangular patch of black on the lower throat, the base sometimes continued as short lines under the chestnut of the neck; back, rump and upper tail-coverts grey, deepening to blackish-grey towards the last, each feather pale-buff at the base and with a large drop of rather deeper



THE IMPERIAL SAND-GROUSE

male below

Pterocles orientalis

female above

$\frac{1}{2}$ life size

buff at the end, and the tail-coverts margined with yellow. Inner coverts of the wing and scapulars like the back but with the terminal spots still larger and yellow-ochre in colour; visible portions of secondary and median coverts yellow-ochre; bastard-wing grey, the outer web of the first primary brownish-black; remaining primaries and secondaries white on the basal half and greyish-brown on the terminal; in nearly all birds the quills have a few curious streaks of brown on either web, looking as if some of the barbs had decomposed; shafts and under aspect of the quills dark brown, axillaries white. Tail with central rectrices barred grey and buff, the terminal inch a grey-green, tipped with a very narrow line of buff, remaining tail-feathers the same but with a broad terminal band of white and each pair of feathers becoming darker towards the outermost, which are deep grey, merely stippled with rufous near the base. Breast a clear grey followed by a black band, which runs up the shoulders in front of the wings; below the band there is a broad belt of vinous or pinkish-grey; remainder of abdomen, flanks and upper thighs and round vent black or deep chocolate-brown, the bases of the feathers rusty and frequently showing through; remainder of lower tail-coverts, thighs and feathering of tarsi white.

Colours of Soft Parts.—“The feet and the back of the tarsi are grey, in some an earthy-grey, in some pale french-grey, or pale plumbeous, or dark greyish plumbeous; the claws darker and horny; the irides are brown; edges of eyelids pale lemon; the bill is pale bluish-grey, or pale plumbeous, often darker, sometimes blackish at the tip.” (*Hume.*)

Iris dark brown, bill bluish-grey, or plumbeous-grey, darker at the tip and varying much in tone and tint. Legs and feet greyish- or bluish-plumbeous.

Measurements.—Wing 8·1 to 9·75 inches (=205·7 mm. to 247·6 mm.), averaging about 9·35 (=237·4 mm.), bill ·44 to ·53 (=10·1 to 13·4 mm.), averaging ·5 (=12·7 mm.), tarsus ·97 to 1·10 (=24·6 to 27·9 mm.), averaging about 1·03 (=26·1 mm.), tail between 4 and 5 (=101·6 and 127·0 mm.).

Males.—“Length 13·75 to 14·75 inches; expanse 27·1 to 30·0; wing 9·0 to 9·9; tail from vent 4 to 5; tarsus 1·1 to 1·25; gape 0·64 to 0·8. Weight 1 lb. to 1 lb. 4 ozs.” (*Hume.*)

Adult Female.—Whole upper plumage a pinkish-grey; the head, nape, neck and upper back with black streaks, formed by each feather having a terminal spot of black, the remainder of upper parts often more rufous and barred, instead of spotted with black. Central tail-feathers like the back, each succeeding pair deepening in colour and with broad terminal bars of white. Chin, throat and sides of the head yellowish-grey, varying considerably in intensity of colouration, the centre immaculate, the sides of the head, lores, and ear-coverts streaked with fine black shaft-lines; lower throat with reversed, half-moon-shaped band of black followed by a pearl-grey band which fades into the pinkish-grey of the breast. This latter is streaked with black, formed by the black central spots to the feathers, and is followed by the black band like that of the male, but narrower and often much broken. Lower breast above abdomen like that of the male, but generally paler; remainder of lower parts similar to the same parts in the male. Scapulars and inner wing-coverts like the back; quills like those of the male but the shade more brownish and the inner webs and tips of the primaries edged white, absent on the first and most broadly so on the innermost; primary-coverts grey, secondary-coverts dark grey, median coverts yellow-ochre on visible portions, otherwise as in the male.

In many females, probably not fully adult, the colour of the throat, breast, and upper abdomen is very smoky and practically the same from the chin to the black abdomen.

Soft parts the same as in the male.

Measurements.—Wing 8·36 to 9·2 inches (= 211·7 to 233·6 mm.), the average being barely 9·0 (= 228 mm.), bill at front from tip to frontal feathering ·42 to ·5 (= 10·6 to 12·7 mm.), and averaging ·47 (= 11·9 mm.), tarsus ·82 to 1·08 (= 20·8 to 27·4 mm.), with an average length of ·9 (= 22·8 mm.), tail about 4·0 to 4·5 (= 101·6 to 114·3 mm.).

Females.—"Length 13·38 to 14·47 inches, expanse 27·38 to 28·5, wing 8·7 to 9·4, tail 4·13 to 4·15, tarsus 1·0 to 1·1. Weight 15 ozs. to 17 ozs." (*Hume.*)

Young Male.—Shot in October; has the whole upper plumage, chin, throat and breast and upper abdomen a pale isabelline or pinkish-grey, barred and vermiculated with blackish-brown. Abdomen black

and under tail-coverts white with black bases. The tail-feathers are barred black and rufous-buff, the latter colour being replaced by white on the outer ones. Wing-quills and primary-coverts grey, tipped with rufous, innermost secondaries and scapulars like the back. The wing of this young bird measures 6·5 inches (=165·1 mm.).

"The *immature male* differs from the adult in having the tips of the primaries and primary-coverts edged with buff vermiculated with black, some of the feathers of the top of the head with a black sub-terminal band and rufous-buff margin, and several feathers of the upper back and scapulars yellowish-buff barred with black as in the female." (*Ogilvie-Grant*.)

Distribution.—*Pterocles orientalis* is found as far west as the Canaries and throughout Northern Africa and to the Sahara from the extreme north-west. It occurs also in the European countries bordering on the Mediterranean, being common in Portugal and Spain and rare elsewhere, but is again more often met with in South-east Russia. In Asia it occurs in Asia Minor, the Caucasus, Palestine, Persia, Baluchistan, Afghanistan and thence into North-west India.

Within Indian limits it is very common in the Punjab, Bikanir, north-west Rajputana, Sind and the Runn of Cutch. It is also fairly numerous in northern Guzerat and the north-west of Central India, and it occurs as far south as Kathiawar, where Colonel L. L. Fenton informs me that "this bird is only an occasional visitor; in some years not a single bird is to be seen, in others a few only, whilst at rare intervals, they come in large flights." In the south of Central India it is much less common, but has been killed as far south as Bhopal.

There is also an account in the 'Indian Field' of the 21st February, 1907, by "Big Bore" of the shooting of three of these Sand-Grouse in Mysore. This is, of course, far out of the ordinary range, and though "Big Bore" was the *nom-de-plume* of a well-known sportsman who had for a great many years been a keen field-naturalist and collector, it is probable that he made a mistake.

To the east the Imperial Sand-Grouse straggles as far as Nepal, from which state there is a female skin in the British Museum

presented by Hodgson, and it has been procured near Lucknow and again a little further east and south near Allahabad. To the north-east it has been obtained both in Kashmir and Gilgit, in the former by Major Stone and in the latter state by Colonel Biddulph, and in Chitral by Major Stirling.

According to Jerdon, Colonel Chesney found this species extremely common in Arabia, but Hume discredits the accuracy of this record on the ground that, zoologically, Turkish Arabia or Mesopotamia is more nearly allied to North-east Africa than to Europe or Asia.

Captain C. R. S. Pitman saw four of these Sand-Grouse at Kamait, a short distance north of Kut-el-Amara, on the 29th January, 1916, and again met with flocks somewhat south of this at Said Hashim on the 16th February, and again at Abu Roman, eight miles east of Sinn, on the 27th February. One of these birds settled close to him and began to feed, whilst others were flying about close by. Again, during the night-march to Sinn on the 7th to 8th March and during the action of the 8th, a fair number of these birds were seen and put up, so they are certainly not very rare as far north as this latitude.

Many other observers frequently met with it during the campaign in Mesopotamia, and there is no doubt it is almost common over much of that country.

The Imperial Sand-Grouse has also been obtained from the Saiar Mountains in the extreme south of Palestine by St. George Littledale, and it, apparently, is found thence northwards and eastwards through Palestine, to Aleppo and Diarbekir in Kurdistan.

Nidification.—According to Whitaker “like all its congeners the present species is monogamous and rather a late breeder, though not as late as stated by most authors, and I have obtained full clutches of eggs by the middle of April. The nesting season of the species, however, continues throughout that and the following month and probably also throughout June.”

Although the Large Sand-Grouse has never been found breeding within Indian limits, its eggs were taken by Lieutenant E. Barnes at Chaman, Afghanistan, on the 15th May, and it is quite possible, therefore, that it may be found breeding occasionally in Sind or the South-east Punjab.

It breeds in Afghanistan, probably (*vide* Delmé-Radcliffe and others) also in Baluchistan, and in Seistan and Persia, the Caucasus, Asia Minor and more or less throughout South Russia and the countries bordering on the Mediterranean, but commonly only in Spain and North-west Africa, and also in Algeria and Morocco, from which last place I have received eggs.

The breeding-season commences in April, when the birds begin to pair, and the eggs are laid in May and June. Those in the collection of the British Museum show that in Spain and Northern Africa the breeding-season is later than it is in Asia Minor and the rest of the bird's eastern range. All the eggs from the former countries are dated between the 27th May and 15th June, whereas those from the eastern countries were taken between the 9th and 15th May. The eggs in my own collection confirm this, as all my Spanish and Algerian eggs are dated between the 30th May and 22nd June, whilst those from the Altai are dated 3rd to 17th May.

The eggs appear to be laid on the ground in a slight hollow scratched out by the parent bird in the sand, and as a rule there is absolutely no attempt made at concealment, the place selected being one quite in the open, though, on some occasions, slight protection from sun and observation may be afforded by a stone, small rock, or tuft of grass.

The full number of eggs laid is three, but two eggs are sometimes incubated. They are typical Sand-Grouse eggs in every respect, being of the usual elliptical form and decidedly glossy, especially when first laid, as they lose the gloss to some extent after they have been kept a few years. The texture is smooth and close, but not very fine, and the eggs are rather brittle and fragile for their size.

The ground-colour varies from greyish stone-colour, pale dull-cream, pale yellowish-grey, pale buff or greenish-grey to a rather warm buff stone-colour, or stone-colour with a distinct green tint. Most eggs are, however, very pale, and their pale dull colouration generally is a distinct feature of this Sand-Grouse's eggs. The superior markings consist of indefinite smudges, blotches and spots of reddish-brown, dull grey-brown or dull rufous-brown, the edges often paler and merging into the secondary markings, which are pale lavender-grey or purplish-grey. The markings, both surface and

subsurface, vary considerably in amount, sometimes being rather sparse, at others rather numerous, but they are nearly always distributed fairly evenly over the whole surface of the egg.

According to Oates the series in the British Museum collection measure from 1·7 to 2 inches in length and from 1·23 to 1·33 in breadth (= 43·5 to 51 and 31·2 to 33·6 mm.). With the exception of three eggs, all those in my collection come within these limits. The three exceptions measure 2·05, 2·07 and 2·10 inches (= 52, 52·6 and 53·2 mm.) in length, but are not as broad as the broadest of the Museum eggs. Including these latter the average of sixty-eight eggs I have measured is $1·86 \times 1·27$ inches = ($47·5 \times 29·8$ mm.). Oates, in describing the Museum eggs, says: "The eggs of the Black-bellied Sand-Grouse are, on the whole, very pale, and present a marbled appearance." This "marbled" appearance is common to all the Sand-Grouse eggs and together with their curious elliptical shape makes them resemble very remarkably the eggs of the *Caprimulgidae* or Nightjars.

Whitaker gives the average of the eggs measured by him as 45×30 mm.

Hartert gives the average of forty eggs as $47·87 \times 32·53$ mm., a very much broader measurement than mine. The maxima he gives as $53 \times 32·5$ and $50·8 \times 34·3$ mm. and the minimum as $45·0 \times 33·0$ mm.

General Habits.—The Large or Black-bellied Sand-Grouse is only a winter visitor to India, its arrival and departure being much influenced, according to Hume and others, by the state of the weather, great heat delaying its arrival and accelerating its departure. The birds generally arrive within Indian limits, i.e., the extreme north-west of the Punjab and Sind, in the first week of October; or, in early years, a few flights may be seen in the last few days of September. They, however, do not seem to work their way further south and east at all fast, as I am informed that they are seldom seen in Cutch until the end of the former month, whilst they do not reach South Rajputana, Central India, and the west of the United Provinces until well on in November. These last-mentioned parts of India they leave again in the latter part of February, and by the end of March but few will be found anywhere, though a few stay

on in unusually cold winters as late as the beginning or middle of April.

Within its favourite haunts, i.e., all round the extreme north-east of the Indian habitat this bird is extremely numerous and may often be seen in hundreds and sometimes in thousands. Hume on one occasion, in Jodhpore, came upon a group of these birds, which he estimated to contain fully two thousand, which were packed together in a mass not more than thirty yards long by about ten wide, and so densely were they lying that, though he could not get within eighty yards of them, he dropped three birds by firing into the mass as they rose.

The same author narrates how when driving between Fazilka and Ferozepur he saw, during the fifteen miles' drive, over 100 *packs* of these birds crossing the road, these *packs* varying from four or five in number to nearly a thousand.

They keep very much to the larger sandy wastes or plains so numerous in this part of India, and though they prefer such as are within reasonable flight of the larger rivers, to which they resort to drink, they are often found at great distance from any water. When there are no rivers near enough, they will then drink at the nearest tank and even at quite small ponds or pools.

Hume thus describes the kind of country most frequented by this Sand-Grouse. He says:—

“ I have but seldom met with them on *stubbles* (though they affect these a good deal, I hear, in some parts of the country), or in any ground under crop, nor have I ever found them on or about the more or less scrub-clad bases of the low hills, so common in Rajputana. Wide, open sandy plains are their favourite resorts; and, though they do sometimes feed on bare ploughed lands, it is rare to find them on these, except when basking in the early morning or when taking their mid-day siesta. This, like all the Sand-Grouse, they always take when the sun is hot, though on cold, cloudy, gloomy days, they are moving the whole day. They bustle about in the sand or loose loam, like old hens, until they have worked out a depression that fits them, and then in this they sit a little on one side, first with one wing a little under them and the uppermost one a little opened, and then, after a time, they shift over to the other side, so as to give the other wing its turn of grilling. During their siesta they are never closely packed; they are scattered about irregularly, one here, two or three there, and so on; and though at this time you may

generally by circling get within reach of them, they are by no means all asleep, and the instant you halt or raise a gun, or fix your eyes on any of them, the alarm-note is sounded, and they are off with a strong, rapid flight, which most of us, at one time or another, have found too much for the second barrel.

"In parts of the country where they have not been shot at, especially when they first arrive, you may easily approach within thirty yards, shoot two or three on the ground, and perhaps a couple more as they rise, but after having been worried a good deal they become the wildest birds imaginable, and then the only plan is to get them driven over you, which, with good native fowlers, is almost a certainty, and affords at the same time most difficult shooting and capital sport. It takes a straight eye, No. 3 shot and a hard-hitting gun, to bring down a clean-killed right and left out of a party going over you, thirty to thirty-five yards high, at the pace these birds can go."

They are very regular and punctual in visiting their drinking-places, more especially in the morning, for this species of Sand-Grouse does not seem to always drink in the evenings. As a rule, the first few birds appear at the river or tank, as the case may be, within an hour and a half after sunrise, and flocks continue to arrive for about two hours, or rather less, after which it is quite useless waiting for other birds to come. In the evening, if they come at all, they generally arrive about a couple of hours before sunset, just as the shadows begin to lengthen and the coolness of the evening becomes apparent.

Where they have been undisturbed the birds come straight down to the water and take their drink, and a good deal of hustling and squabbling takes place, especially when two or more flocks, or packs as they should be called, arrive at the same time. Where, however, the birds have been much shot at, the packs will come down at a great pace, high overhead, and often take two or three circles round in the air before they venture down to the water.

Even when they drink from big rivers these Grouse seem to have certain places which they favour more than others, but it is when they drink at tanks and other small pieces of water that the native, and often indeed the European sportsman, takes the heaviest toll of them. At such places the shooter hides himself either in a hole in the ground or else behind such cover as may be available; and, if suitably dressed and sufficiently quiet in his movements, may be

certain of obtaining a satisfactory bag. Often in this manner a couple of guns will obtain a very large bag of this and other Sand-Grouse, and Hume records a bag of fifty-four couple of this species alone, made by three guns in a couple of hours.

The native fowlers and professional snarers also take advantage of this habit of the Sand-Grouse and catch a very great number for the market by means of nets and snares at the drinking-places. When nets are used they are placed close to the drinking-place athwart the favourite line of flight; the nets are some six feet in height, and are kept erect by sticks, which are so put up that the first impact from a flock of birds knocks them over, and many of the flock are entangled in the meshes and are easily caught. When nooses only are used, these are placed in great numbers at the edge of the water, either pegged down singly or attached in rows to one long string, which is pegged down, or weighed down, at either end.

They keep no regular formation either in flight or when basking and feeding. The first thing in the morning many packs often collect together and lie in the sun warming themselves, and at this time appear to get on well enough until they break up into their respective parties and make their way to water; when, however, they again meet, either at the water-side or on their own feeding-ground, they are very quarrelsome, and a constant bickering fighting goes on amongst the males, this often taking place even between members of the same flock.

Their flight is very swift and powerful, and the sound of their wings makes a soft swish, which, when the birds pass very close, rises almost to a whistle. In appearance their action is much like that of a pigeon and they rise and fall in the air with equal ease and grace, but the beats of their wings are never accompanied by the clapping sound made by the wings of the pigeons meeting overhead when those birds suddenly change their elevation or direction.

Their note is described by some writers as a clucking sound difficult to write down in words; other observers call it a soft double chuck or chuckle which is uttered both when on the wing and when on the ground, and when feeding and drinking. Indeed, even when the birds are indulging in their mid-day rest, a few will be seen constantly moving about and chuckling softly to themselves.

Their diet is mainly a vegetarian one, consisting for the most part of seeds and grain, and to a very small extent of young shoots and buds; but they will also eat small insects of all kinds—white ants, beetles, larvæ, etc.—but never, as far as I can ascertain, worms or similar items of food.

When they first arrive in India, the flocks consist entirely of one sex, either male birds only or females only; but as the season advances the flocks seem to become mixed, and some time before they take their departure they will be found to contain about equal numbers of either sex. I have been told that the first few flocks to reach India will invariably be found to consist of males, but, though this is quite possibly correct, I have not as yet been able to verify it.

For the table they are generally said to be good, though, as usual, opinions differ somewhat on this point. Jerdon writes: "The flesh is mixed brown and white on the breast, though somewhat tough when fresh, and perhaps requiring to be skinned, it is reckoned delicious eating; indeed, one writer says that it is the finest game-bird for the table in India."

Whitaker's description of the habits of *Pterocles orientalis* (Birds of Tunisia, p. 236) in Tunis agrees well with that given by Hume; he writes:—

"The present species is eminently a denizen of the plains, and more particularly semi-desert plains, where sandy hillocks, strewn with stones and dotted with patches of Halfa-grass are a characteristic feature of the country. The tops of these hillocks or mounds are favourite resorts of the birds during the middle of the day for resting, or basking in the sun, and possibly also for roosting at night. In these spots the birds remain quietly for the greater part of the day and do not leave them except for drinking and feeding purposes. Like other Sand-Grouse, *P. arenarius* is chiefly to be seen during the early morning and evening hours, when on its way to and from its drinking and feeding haunts. It is said to drink regularly twice a day, but in Tunisia I never observed the bird drinking except in the morning. To reach the water they often travel a great distance, but no doubt do this with the greatest ease, being remarkably strong and swift on the wing. When rising from the ground the rattling noise this species makes, probably with its wings, is most peculiar, and unlike that of any other bird with which I am acquainted. The note it utters when on the wing, and which may be heard at a great

distance, is like the word 'catarr' repeated several times, whence the bird's Arabic name 'Katarr.' When disturbed, it will travel a great distance, often completely out of sight, before sitting down again, but at its drinking resorts it seems loth to leave the spot until its thirst is quenched."

The species feeds chiefly upon the seeds and tender shoots of wild plants, though when in the vicinity of cultivated land it will resort thereto in search of grain. Sand-Grouse, in general, are difficult to skin, their feathers, like those of pigeons, being loosely attached to the skin; and it requires all the taxidermist's art to make good museum-specimens.

PTEROCLES INDICUS.

THE PAINTED SAND-GROUSE.

Pterocles indicus, *Gmel. Syst. Nat. I.* ii, p. 775 (1786) (Coromandel Coast); *Hartert, Vog. Pal.* p. 1513 (1920).

Indian Grouse, *Latham, Gen. Syn.* ii, p. 752 (1783).

Tringa fasciata, *Scop. Del. Flor. et Faun.* part 2, p. 92 (1786).

Pterocles fasciatus, *Gray, List B.* iii, p. 49; *Blyth, Cat. B. A. S. M.* p. 249; *Jerdon, B. I.* iii, p. 498; *King, J. A. S. B.* xxxvii, part 2, p. 216; *Blanford, ibid.* xxxviii, p. 188; *Hume, ibid.* xxxix, part 2, p. 139; *MacMaster, ibid.* xl, part 2, p. 214; *Stoliczka, ibid.* xli, part 2, p. 249; *Hume, Nests and Eggs*, p. 511; *Adam, S. F.* i, p. 391; *Ball, ibid.* ii, p. 426; *id. ibid.* iii, p. 293; *Butler, ibid.* iv, p. 4; *Fairbank, ibid.* p. 262; *Butler, ibid.* v, p. 231; *Davidson & Wend, ibid.* vii, p. 86; *Hume, ibid.* p. 162; *Ball, ibid.* p. 225; *Hume & Marsh. Game-B.* i, p. 59; *Hume, Cat. No.* 800; *Butler, Cat. B. of Sind, &c.* p. 52; *McInroy, S. F.* viii, p. 492; *Tufnell, ibid.* ix, p. 201; *Heaviside, ibid.* p. 202; *Butler, ibid.* p. 421; *id. Cat. B. S. Bom. Pres.* p. 67; *Davidson, S. F.* x, p. 316; *Barnes, B. of Bom.* p. 295; *id. J. B. N. H. S.* v, p. 334; *Laurie, ibid.* vi, p. 94; *Hume, Nests and Eggs*, iii, p. 364; *Nurse, J. B. N. H. S.* xiv, p. 172; *Major F. J. N. Barton, ibid.* p. 606; *Ogilvie-Grant, Cat. B. M.* xxii, p. 27; *Oates, Game-B. In.* i, p. 45; *Blanf. Avifauna, B. I.* iv, p. 55; *Le Mess. L. and W. B. of In.* p. 56; *Barnby Smith, Avi. Mag.* (1910), p. 313; *J. E. C. Jukes, J. B. N. H. S.* xix, p. 216; *Betham, ibid.* p. 990; *Whitehead, ibid.* xx, p. 968; *Moss-King, ibid.* xxi, p. 100; *Stuart Baker, ibid.* xxii, p. 219; *Allen, ibid.* xxvi, p. 672 (1919).

Pteroclis fasciatus, *Sharpe, Hand-I.* i, p. 51; *Oates, Cat. Eggs B. M.* i, p. 79.

Pterocles quadricinctus, *Jerdon, M. J. L. S.* xii, p. 4; *id. Ill. In. Orn.* plates 10 and 36.

Vernacular Names.—*Pahari Bhat-Titur, Bhat-ban, Dongar Rowrie, Hin. N. W. P.*; *Chapka, Saugur (Moss-King); Gutila titur, Mirzapur (Allen); Palki, Belgaum; Handeri, Southern India; Kal-Goujal Haki, Canarese, Mysore; Sonda Polanka, Tamil.*

Description. Adult Male.—Forehead white followed by a black band, then by another white one, each band being about '2 inches wide; remainder of crown reddish-buff spotted with black or deep chocolate-brown; hind-neck olive-yellow or olive-buff; upper and



THE PAINTED SAND-GROUSE

male.

Pterocles indicus.

female

lower back, upper tail-coverts and rectrices a rather chestnut-buff, barred with black, the black bars increasing in width and becoming V-shaped on the last, which with a few of their outer tail-coverts are tipped yellow-buff. Scapulars like the back but more boldly marked, many of the bars being somewhat grey and most of the feathers being broadly tipped with yellow-buff. Wing-coverts buff, the innermost being tinted like the nape and gradually changing to an ochreous-buff on the outer; a small patch next the scapulars marked in the same way as those feathers. Winglet, primary-coverts and primaries dark brown, the last margined paler; inner secondaries like the scapulars, their coverts barred white and slate-colour with deep buff edges and with the margins of the slate bars black. Under aspect of wing a grey-brown, inclining to buff near the shoulders. Chin, throat, side of head, fore-neck and upper breast ochreous-buff, bordered by a broad, bright-chocolate band, which is succeeded by a band of whitish-buff, both these bands running right up under the shoulder of the wing to the back; rest of abdomen, flanks, thighs and vent banded deep-brown or chocolate-black and white; below the white breast-band the bars are obsolete, giving here the appearance in some birds of a definite deep-brown or black band; under tail-coverts banded buff and black.

"*The colours of the soft parts vary somewhat. I have recorded the feet as dirty yellow, pale reddish-olive, pale dingy-brown, pale orange-brown; the irides as brown, the skin round the eyes as yellowish-green, and again bluish-yellow; the bill as brown, reddish-brown, reddish-horny, dingy orange-red, and dark orange-red.*" (*Hume.*)

"Bill red; orbital skin lemon-yellow; irides dark-brown; feet dull yellow; claws reddish." (*Jerdon.*)

Measurements.—Wing 6·25 to 7·25 inches (= 158·7 to 184·1 mm.), averaging 6·7 (= 170·2 mm.), bill at front ·49 to ·58 (= 12·4 to 14·7 mm.), averaging ·52 (= 13·2 mm.), tarsus ·88 to 1·01 (= 22·3 to 25·6 mm.), averaging ·95 (24·1 mm.). As regards wing measurements it should be noted that only four birds out of over one hundred measured had a wing exceeding 7 inches (= 177·8 mm.), and only some half a dozen a wing of under 6·5 (= 165·1 mm.).

"The sexes differ but little in size. From a very large series of measurements taken in the flesh I find that—

“Males measure: Length 10·5 to 11·25, expanse 19·75 to 22·5, wing 6·4 to 7·0, tail from vent 3·25 to 3·75, tarsus 0·88 to 1·0, bill from gape 0·58 to 0·7. Weight 6 to 7·5 ozs.” (*Hume.*)

Jerdon gives the weight of the male as from 7 to 8 ozs.

Variation in the colour of individual adult males consists principally in the depth and tone of the tinting of the upper surface. This in some birds is deeper and more reddish and in other birds paler and more buff. There is also considerable difference in the grey markings on the scapulars, etc., in some these being quite a french- or slate-grey, in the centre of the bars, whereas in others the centre of the bar is almost concolorous with the margins.

Adult Female.—Whole crown as in the male, but the forehead without the black and white bars; nape more yellow-buff and with the spots smaller than those on the head; whole remaining upper surface a reddish- or chestnut-buff, paling to ochreous-buff on the rectrices and marked throughout with very deep-brown or black bars, those on the tail being broadest; scapulars and innermost secondaries broadly tipped with pale yellow-buff, winglet, primaries, primary-coverts and outer secondaries, as in the male, brown; inner secondaries like the back but with broader bars and often with a vinous tint on the outer webs; lores and sides of the head fawn with black striæ; chin and upper throat fawn-buff, immaculate in old birds, finely spotted in young ones; whole lower surface barred buff and deep-brown, the buff bars becoming more or less white on the abdomen, where the brown bars deepen to black.

Females of this species vary almost more than the males, and the difference in tint on the back is very great, varying from a rich, almost rufous bay, which, however, is very rare, to a pale sandy-buff which is very common. The colours of the lower parts vary less, but birds are sometimes met with which have the breast-bars almost white, the buff tint being quite faint and irregularly distributed.

The colours of the soft parts do not differ from the corresponding parts in the male.

Measurements.—Wing 6·0 to 6·9 inches (= 152·4 to 175·2 mm.), averaging 6·55 (= 166·3 mm.), bill at front ·47 to ·56 (= 11·9 to 14·2 mm.), averaging ·51 (= 12·9 mm.), tarsus ·85 to ·98 (= 21·5 to 24·8 mm.), with an average of about ·94 (= 23·8 mm.).

Hume gives the measurements as follows: "Length 10 to 10·5, expanse 19·5 to 20·5, tail from vent 3·25 to 3·75, tarsus ·88 to 1·0, bill from gape ·55 to ·6. Weight 6·38 to 6·75 ozs."

It will be seen, therefore, that Hume's measurements practically agree with mine and show that, age for age, males are a trifle bigger and heavier than females.

Young Male.—The young bird acquires the plumage of the adult first on the wings and upper plumage, but this is much broken up with dark brown vermiculations; the tips of the quills and sometimes the inner portions of the inner webs are marked with pale-buff vermiculations and the plumage of the upper back, hind-neck and head is more like that of the female, but these parts also are everywhere profusely vermiculated. On the under surface the deep breast-band is either obsolete or indefinite and much mixed with buff. From the breast downwards the lower surface of the body is banded black and white as in the adult bird, but the bars are narrower and not so perfect. The white forehead seems to be one of the last parts of the adult plumage to be acquired.

At a still earlier age, the whole of the back is vermiculated buff and black and the general colour varies through as wide a range of tints as in the adult. On the under parts the breast and abdomen are still more weakly barred than in the stage just described, and the bars on the centre of the abdomen and about the vent often merge into a blurred patch of black or dark-brown.

"Young females resemble young males, but the under parts are like those of the adult female." (*Ogilvie-Grant.*)

The nestling is covered with a uniform earth-brown down, the same colour as the soil on which the eggs are laid.

Distribution.—The habitat of this beautiful Sand-Grouse is given as follows by Blanford:—

"Peculiar to India and resident. Found in suitable places throughout the greater part of the Peninsula, but not on the Malabar or Bombay coast, nor in the forest region north of the Godaveri and east of Raipur, Mandla, etc., nor in the low grounds of the Carnatic. This Sand-Grouse is found throughout the Deccan and the Central provinces and as far south as Mysore, and is common in parts of Guzerat, Cutch, Rajputana, the North-west provinces and amongst the Siwalik Hills of the North-west Punjab, but does not occur west of the Indus, nor on the Gangetic alluvium."

Its range has now to be carried considerably further east and also north-west across the Indus. In the Santhal Parganas I shot two birds out of a small flock, which for some days frequented some ravines close to the Birbhum Road between Nya Doomka and Suri. I have records of its appearance both in Ranchi and Hazaribagh and in Gya, further east than recorded by Hume, in the plains at the foot of the Ranga Hills. All these places are very dry and stony and are situated in amongst, or near, hills, which are broken up with ravines and dry water-courses, but at the same time have a growth of jungle, scrub for the most part, but in others stunted trees and short coarse grass. None of the districts mentioned come within the area described by Hume as the "low, rich, unbroken alluvial plains in . . . the whole of the Lower Bengal and Assam."

As regards the north-west Major F. J. K. Barton records in the B.N.H. Soc. Journal that *P. fasciatus* has been shot almost every year since 1895, at Rustom, some twenty miles from Mardan, in the Buner foot-hills. He says: "Painted Sand-Grouse are found near Rustom in low stony hills with a fair quantity of jungle growing on them. They are generally put up in pairs or small flocks. The natives say they are always there, but that the numbers vary, some years there being more than others."

It has also been procured near the Orakzai, about half-way between Bannu and Peshawar, and it is probable it will be found all along the foot of these hills. Mr. H. G. O. Bridgeman, in writing to me, says that these birds are comparatively common on the "Kala Chitta and neighbouring hills just south of Campbèllpore during October, and . . . it is difficult to believe that they never cross the River Indus, as opposite to where the Kala Chitta Hills meet this river, exactly similar ground is almost within stone's throw."

Finally, Major Whitehead records that a Mr. McDónald obtained one of a pair in the scrub-jungle west of Shinauri (3,800 feet).

Nidification.—Wherever the Painted Sand-Grouse occurs it is a resident and breeds, and young birds or eggs have been taken from every part of the tract of country it frequents.

The principal breeding-season is probably April to early June, but eggs have been taken at all times of the year, and it is difficult to say with any certainty that these are the favourite laying-months.

It is also probable that very few breed during the height of the rainy season, i.e., from July to the early part of October. Amongst others who have reported the time eggs have been taken are the following :—

Pythian-Adams, Davidson	...	...	January.
Butler, Colonel R. Bingham	...	...	February.
Mosse, Davidson, Wenden	...	...	March.
Hume, Adam, Pythian-Adams, Bulkley	...	...	April.
Nunn, Hume, Davidson, Bulkley, C. T. Bingham	...	...	May.
Barnes, Felton	...	...	June.
Thompson, Davidson	...	...	November.
Pythian-Adams	...	...	December.

As one would expect from its habits the Painted Sand-Grouse generally deposits its eggs in ravines, broken ground, etc., where there is a certain amount of cover and, in the Central Provinces, actually in forest-land. As a rule it makes no nest at all, though a few odd pieces of grass may, perchance, collect in the hollow it scratches out in the earth before depositing its eggs. Sometimes, however, it does make some pretence of a nest, collecting a few bents and grasses and fashioning these, by pressure only, into a hollow cup, fitting the depression already made in the earth. Mr. R. Thompson also describes a nest which would appear to have been yet a further advance in architectural skill :—

“The nest contained three eggs, of which one unfortunately got broken. It was placed on the ground on a slight rise; neatly and well put together, saucer-like, made of dried grass, bits of dried leaves of bamboo and other plants. The soil was sandy, with a thin forest growing on it, and the nest was placed under the shade of a small tree. There was no cover in the immediate vicinity of the nest; in fact, for three or four yards all round there was nothing but short thin grass. I accidentally arrived at the spot, and whilst talking to a friend, the female bird got up close at our feet, and I saw the nest immediately.”

Ordinarily, however, it makes no nest at all and nearly all observers write to this effect.

Captain Mosse gives me an interesting account of some young birds found by him :—

"I have only once come across a nest. This was on the 14th March, 1904, in Kathiawar. I was at the time riding through a bastard-teak jungle, and, dismounting to investigate the cause of a slight temporary lameness of my pony, caught sight of a pair of bright eyes fixed upon me a few feet away. The owner of the bright eyes being approached still nearer, rose and showed herself to be a Painted Sand-Grouse. The nest, which was merely a slight depression, unlined, contained two young ones a few days old. They were quaint little objects, which flattened themselves down as close to the ground as possible, and they had a peculiarly flattened-out shape which enabled them the better to do so. Their covering was of a peculiar flakey character, neither down nor feathers, but something between the two, and their colour was a uniform brown, the exact shade of the surrounding earth."

The normal number of eggs in a clutch is undoubtedly three, though very often two only are laid, and very rarely four may be found, such a clutch having been taken by Mr. R. M. Adam. They are in shape elliptical, both ends being equal, as is the case with the eggs of all sand-grouse, and they are much the same in size as those of the Common Sand-Grouse (*P. exustus*) but average a shade longer and a trifle less broad. Hume thus describes the large series which have passed through his hands:—

"As a body they are very regular, obtuse-ended, cylindrical ellipsoids, the shell very smooth and glossy, the ground colour a delicate pale salmon pink, with a good many somewhat widely scattered specks and tiny streaks of brownish red, very generally much more numerous towards one or other end, and with a good many small pale inky purple spots and clouds almost exclusively confined to that end where the markings are most numerous.

"Specimens are occasionally met with in which the markings are very sparse, and I have one specimen in which they are absolutely and entirely wanting.

"Not infrequently the markings form a pretty perfect zone towards one end, and here and there an egg is met with exhibiting six or eight large deep brownish-red blotches. Pale pinky white, and somewhat buffy stone-colour grounds are also met with.

"Dr. Jerdon remarks: 'I have had the eggs brought me, very cylindrical in form, of a dull earthy green with a few dusky spots; but these most assuredly were eggs of *P. exustus* and not of our present species *P. fasciatus*.'

"In length the eggs vary from 1·3 to 1·62 inches, and in breadth from 0·93 to 1·05, but the average of forty eggs is 1·42 by 0·98."

These figures in millimetres are, roughly 33 to 40, 23·5 to 27, and 36 by 25 mm.

The series in my own collection all agree with Hume's eggs except one pair which have the ground-colour a pale dull sea-green, with a few faded grey and brown blotches and spots sparsely but evenly distributed over the whole surface. These eggs were taken by a good sportsman who knew both the Painted and the Common Sand-Grouse well and I have no reason to doubt their identification, though I cannot guarantee it. Jerdon, notoriously, cared little for eggs and was constantly incorrect in this particular, so little reliance can be placed on the identification of his eggs referred to by Hume above. Nor do my eggs agree with Jerdon's, which seem to have been coloured much like those of *exustus*, whereas the eggs in my collection are very pale and weakly-coloured, far more so than any I have seen of that bird.

I have also a remarkable pair of eggs taken by Mr. Vidal at Nassic; these have the usual cream or salmon ground, but are profusely blotched all over with bright red-brown and underlying marks of grey and neutral tint. I have seen no other eggs nearly so boldly marked as these are, and such colouring must be very exceptional.

In size all my eggs come within the limits given by Hume and the average of eighty eggs, including his, is $35\cdot8 \times 24\cdot99$ mm.

The season during which the Painted Sand-Grouse should be protected might be taken as from the 1st April to 1st October, by which latter date the great majority of young would be well able to take care of themselves.

General Habits.—The habits of the Painted Sand-Grouse are very different from those of the Common Sand-Grouse, our one other Indian resident which can compare with it in numbers. It is essential for this bird that it should have a certain amount of cover, and where this is absent the bird will not be met with. Its favourite resorts are low rocky hills and the country immediately surrounding them, but the soil must be comparatively dry and the cover must be neither too dense nor too sparse. Tree- and evergreen-jungle it seldom enters and it prefers low scrub-jungle, especially such as is rather sparse and scattered and which is broken up by numerous stony ravines and dry, or nearly dry, water-courses.

It is seldom found in large flocks, more often in pairs than anything else, and, according to Hume, seldom in packs of over ten, which is the largest number he has personally seen together.

Mr. Bridgeman writes that he always found the birds in small parties of four or five, that is to say, in small family parties consisting of the parent birds and their last brood.

Occasionally, however, it does collect in much larger flocks, and some of my correspondents mention packs of over one hundred. Mr. E. Pythian-Adams says: "When marching through the Berars, at one of our halting-places we put up about 200 from a scrub-covered hill. At other times I have only seen a few together."

So, also, Captain Nurse in the 'Journal of the Bombay Natural History Society' (*loc. cit.*) records:—

"It is usually found only in small flocks, but this morning, when shooting over some ravines covered with a little grass and a few bushes, I came across a large number, not less than two or three hundred. They were chiefly in flocks of from two to six, but there were several packs of ten or a dozen, and one flock of sixty or eighty birds. They were very wary and I seldom succeeded in getting within thirty yards of them. However, I managed to shoot twenty-one, which is the largest number of this species I have ever killed in a day, chiefly by standing behind a bush and having them driven towards me. I could certainly have got more if I had cared to stay later, as they did not fly to any great distance and could generally be marked down."

Captain A. H. Mosse sends me a very interesting account of this sand-grouse's habits, which shows well the many ways in which it differs from the majority of its relatives. He writes:—

"It is common enough in all the less cultivated and more jungly parts of Guzerat, preferring more or less hilly country where the jungle is not too dense, and rarely, if ever, resorting to the open plains beloved of the Common Sand-Grouse. During the monsoon months, however, it does sometimes visit the more civilized parts, but only where there are trees; for instance, I have seen it at Baroda in the month of June.

"It does not ordinarily collect in large numbers like the Common Sand-Grouse, and as far as I can recollect, I have never seen more than seven or eight together, except when the flocks meet at a common drinking place. It differs, too, from the Common species, and from the Imperial Sand-Grouse, in its drinking habits. These two, as is well-known drink in the morning after the sun has

become hot and sometimes also, at least in the case of *P. exustus*, a couple of hours or so before sunset. *P. fasciatus*, on the contrary, always drinks at dusk, never in my experience before the sun is well below the horizon.

"It is a much more silent bird than *P. exustus* and, unlike the latter, it flies always within a few feet of the ground, so that it rarely shows up against the sky line and is not too easy a bird to shoot in the fading twilight. It does not, however, take as much killing as its notoriously tough relative, falling, when hit, to smaller shot at greater distance.

"On one occasion, when I was sitting up for a panther near a pool in a river bed, in the north of the Mahi Kantha Agency, the Painted Sand-Grouse kept coming to drink in the gathering dusk in small parties until there were, at a rough estimate, about 150 birds collected at the water's edge in a patch of some thirty yards in length. This is the only time I have seen so large a number together, and quite a noise they made with their chattering, both as they arrived and on the ground before drinking. The single note, softer and lower than that of the Common Sand-Grouse, I have never heard except at dusk. When they alight on the ground they drop very suddenly and then squat like a nightjar.

"Although I have never personally seen this Sand-Grouse drink except at dusk, it is not impossible that, in the hot weather, it may also sometimes drink at dawn before the sun is up. I have more than once seen it on the wing at this time of the day."

Hume mentions the fact of their drinking in the morning and Blanford also says that they fly to water before sunrise and after sunset, but neither of these writers gives any further details as to their watering in the early dawn.

Adams, as quoted by Hume, gives a rather similar account of the visit of these birds to a small pond in an acacia grove, and in this says that his attention was first drawn to the birds by the "peculiar *cluck, cluck*, which *fasciatus* makes when rising." He also adds that on alighting, the birds "lay perfectly still for two or three seconds and then all of them commenced a rapid run down to the water."

Adams also states that "the Painted Sand-Grouse entirely leave the forests and jungle in the early part of the rainy season and then live in the open country, all through the rains, exactly as *P. exustus* does."

Although distributed over a very wide area and comparatively

common in many parts of it, nowhere does this bird appear in the enormous numbers that *P. arenarius*, *P. exustus*, and *P. alchata* do, consequently the huge bags which are sometimes made of these Sand-Grouse are never equalled by the bags made of *P. fasciatus*. Hume writes :—

“Where they are abundant they afford extremely pretty shooting, and twenty to twenty-five brace is by no means an out-of-the-way bag for two good guns. Even though at first flushed in parties of seven to ten, they break up into pairs and singles after the first shot, and lie well. I have never seen them wild or rise at greater distances than thirty or at most forty yards, and very often they whirl up within a few feet. They rise with a chuckling chirp, fly low, and soon alight again, however, running a considerable distance after they have alighted. They run extremely well, compared with other Sand-Grouse, as I have repeatedly noticed when standing above whilst others were shooting below. For a moment I have often mistaken them for grey partridges.

“Although their flight is strong and tolerably fast, they offer an easy shot, and can be dropped with charges, and at distances, that would afford little prospects of a kill in the case of *exustus*.

“Their plumage is very delicate, and half the feathers of the back and breast are often knocked out by the fall when they are shot. The aural orifices are very large, and being only partially covered with feathers of which the webs are very far apart, are conspicuous; but the birds do not appear to hear particularly well, or if they do, they are very tame or stupid, for they continually rise at one's feet, and if much disturbed lie so close that they are almost as hard to raise as button quail.

“Their crepuscular habits are undoubted, though I cannot say that I myself have often noticed them after dusk.”

Nearly all sportsmen agree with Hume in considering that they are far less wild and smart than most Sand-Grouse and that they are also easier to kill. Colonel Fenton remarks, *in epistolâ*, “when flushed they do not fly very far before pitching again. By marking them down and flushing them again one can go on shooting at them over and over again, until one and all the birds in a covey are bagged.” Lieut. Pythian-Adams says just the same, and Jerdon, Thompson, Adams, and other writers all give similar accounts.

Mr. Bridgeman points out that these grouse when flying keep much closer together than the other species do, so that frequently more than one bird gets knocked over by the same shot, and that he himself has

once dropped three birds out of four and several times two out of four and this without in any way being guilty of "browning."

The Painted Sand-Grouse appears to be almost exclusively a vegetarian, and the crops of those examined by Hume and others have so far contained practically nothing but grain and seeds of various kinds. They seem also, to keep very much to a hard diet, and only one or two of my correspondents mention their indulging in green-food, though they undoubtedly do eat such sometimes. They certainly eat termites—but squirrels even, as well as doves and similar vegetarian feeders, will all tackle and swallow these with greediness—and one correspondent says that he found them feeding on ants. Probably they eat small insects fairly regularly as they come across them, though they may not go out of their way to hunt for them when grain is handy.

Captain Heaviside records a curious habit he observed in these birds in the Nerbudda Valley, where he noticed them "in the evenings on the cart-tracks, where they were probably dusting themselves as there is no grain-traffic on these roads."

Mr. G. O. Allen describes another very curious habit of this sand-grouse:—

"I was taken this evening by a friend of mine to a small spot well-known to him about twenty miles South of Mirzapur, where the Painted Sand-Grouse came and scratched in the evening. It is a small bit of ground about thirty feet long entirely bared of green by these 'Painters' which come and scratch there at dusk, the earth presumably having some peculiar attraction. The birds come in large numbers just at sunset and the same place is apparently used year after year. They must come from far off as I have never heard of any of these birds being shot within ten miles or so of the place."

These Sand-Grouse suffer to a certain extent from snarers and bird-catchers, but owing to their habits and to the fact of their not going about in large flocks, they do not fall victims to anything like the extent that *P. orientalis* and *P. senegalensis erlangeri* do. Adams says that "large numbers of the Painted Grouse are taken during the rainy season by bird-catchers, who, approaching under cover of a screen made of green leaves and twigs, drop a circular net, suspended to a hoop and held out horizontally at the end of a long bamboo, over the birds, which as a rule never seem to suspect that danger is at hand."

The most common means adopted to snare them is by nooses laid at the regular drinking-places, in the same way that all the other Sand-Grouse are taken.

The following excellent account of these birds in captivity is given by Mr. Barnby Smith in the 'Avicultural Magazine.'

"The habits of the Painted Sand-Grouse were from the first strikingly different from those of the Pintail. When the latter were frightened their instinct was to fly, whereas the Painted Sand-Grouse crouched all together in a corner as though it was their nature to seek cover; although as a fact, there was no cover there.

"I accordingly provided them with another enclosure very similar to the first, except that nearly all the floor space was covered with tussocks of grass, small box bushes, dwarf juniper, etc., of course with sandy spaces at intervals. I found the birds always loved to lie in the sun near a tussock of grass, and would be seen to have moved their position several times a day so as to get full sunshine. This surprised me, as they are said to be crepuscular and nocturnal in habit. Their large staring black eyes would quite give one this impression. Whatever they do by night, their habits by day are most unexpected, and they justify their common name of 'painted' in an extraordinary manner, for they might as well be merely painted birds as far as any movement can be observed in progress. One might go to look at them half a dozen times a day for weeks without seeing them making any movement. The seed put down vanishes, and the birds keep a good gloss on their feathers and appear to be in excellent health. Very occasionally one may be seen moving, but the same instant the bird will catch sight of you and draw in its head and remain squatting motionless, however long you remain to watch. If approached within a couple of feet, however, the bird will attempt to fly, with its wild alarm note of "yek-yek-yek," and land behind another tuft of grass. After one attempt to fly, if again approached, it will permit itself to be handled. It is said that bird-catchers in India take these Sand-Grouse by approaching them under cover of leaves and dropping a net suspended at the end of a bamboo. Having seen the birds themselves I can readily imagine the possibility of such a method of capture.

"To make up for their uninteresting habits, it must be conceded, however, that the Indian Painted Sand-Grouse have most exquisitely marked plumage, the markings on the cock especially being most striking. Even in rough grass they are very difficult to see at short distance, but our English grass is too green to hide them perfectly. I should imagine that in their native haunts they will form a perfect example of obliterative coloration."



THE CORONETTED SAND-GROUSE

female

Pterocles atratus

life size

1931.

PTEROCLES CORONATUS ATRATUS (Hartert).

THE CORONETTED SAND-GROUSE.

Pterocles coronatus, *Lich. Verz. Doubl.* p. 65 (1823); *Hume, Ibis*, 1872, p. 468; *id. S. F.* i, p. 224; *Wise, ibid.* iii, p. 267; *Hume, ibid.* p. 41; *Wise, ibid.* p. 230; *Blanford, E. Persia*, ii, p. 272; *Hume, S. F.* vii, p. 161; *Hume & Marsh. Game-B.* i, p. 57; *Butler, Cat. B. of Sind, etc.* p. 53; *Tufnell, S. F.* ix, p. 200; *Barnes, ibid.* pp. 219, 458; *Lean, ibid.* p. 296; *Barnes, B. of Bom.* p. 209; *id. J. B. N. H. S.* v, p. 336; *Ogilvie-Grant, Cat. B. M.* xxii, p. 23; *Blanford, Avifauna of B. I.* iv, p. 37; *Oates, Game-B.* i, p. 41; *Ogilvie-Grant, Game-B.* i, p. 18; *Le Mess. Game-B.* p. 57.

Pteroclis coronatus, *Sharpe, Hand-L.* p. 51; *Oates, Cat. Eggs B. M.* i, p. 51.

Pterocles coronatus atratus, *Hartert, Bull. B. O. U.* February, 1902; *Stuart Baker, J. B. N. H. S.* xxii, p. 427; *Hartert, Vog. Pal.* p. 1509 (1920).

Vernacular Name. *Katinga*, Sin.

Adult Male.—Centre of forehead white, a broad patch of black on either side carried round the base of the bill and down the centre of the throat as a broad streak; crown dull vinous-grey or vinous-buff, surrounded by a pure french-grey which forms a broad supercilium and divides the crown posteriorly from the bright, deep ochre of the collar on the neck; lores and next the anterior black of the chin and throat white, merging into the yellow-ochre of the side of the face, throat and neck. Rest of the upper parts isabelline, the feathers of the interscapular region and the lower back and upper rump with pale centres, giving a faintly mottled appearance to these parts; scapulars the same, but with a bar of grey below the pale spot, produced on either side towards the tip. Primary-coverts and bastard-wing brown, primaries brown, the fifth edged pale-buff on the tip of the inner web, this buff tip increasing in width on each succeeding feather and forming a broad buff band obliquely across the inner primaries; secondary-coverts buff, median coverts rufous-buff or vinous-buff, with pale centres and oblique grey patches on the outer visible webs; small shoulder-coverts vinous-buff gradually changing into the

same as the median coverts, as these are approached. Lesser and median under wing-coverts and axillaries white; under primary-coverts brown. Body below buff, greyish on the upper breast next the head and more ruddy-buff on the abdomen. Feathers round vent dull chestnut-brown, under tail-coverts white, the bases chestnut-brown; feathers of thigh and tarsus buff, the latter often marked with chestnut-brown. Tail isabelline, the central rectrices faintly tipped paler, the other feathers rufous-buff broadly tipped white and subtipped dark brown.

The principal variation in the colour of the upper parts of the male bird is in the extent of the pale markings to the scapulars and dorsal plumage; in some birds these are very large and make the upper part appear paler and brighter in tone. The general tint of Asiatic specimens varies a good deal in depth, but there are none so pale as the same bird becomes in North Africa and Spain. There are but three males in the British Museum collection other than those from India or adjacent countries, but these can be separated at a glance from the rest by the very pale vinous isabelline of their upper parts.

The colour of the forehead between the two black patches varies from pure white, which is rare, to the same colour as the crown.

Below the birds vary in purity of colour and extent of white on the abdomen, but Asiatic and other specimens vary equally *inter se* in this respect.

Measurements.—Asiatic birds in the British Museum collection average: Wing 7·30 inches (= 185·4 mm.), tarsus ·89 (= 22·6 mm.), and bill ·43 (= 10·9 mm.), and the three African birds, wing 7·81 (= 198·3 mm.), tarsus 1·00 (= 25·4 mm.), and bill ·50 (= 12·7 mm.). “Weight 8½ ozs.” (*Lean.*)

“In the *immature male* the tips of the primaries, centre pair of tail-feathers and some of the secondary-coverts and scapulars are buff vermiculated with black.” (*Ogilvie Grant.*)

Adult Female.—Crown vinous-buff, each feather with a central streak of black; lores, supercilium and round the eyes grey, with fine black striæ; chin, throat, fore-neck and sides of the head ochreous-yellow, less vivid than the male and spotted with black, much so in young birds, scantily so in those fully adult; the yellow is produced

round the hind-neck as a rather indistinct collar. Whole upper surface dull sandy-buff, each feather barred with black, those of the upper back being also subedged black, and having a small black centre spot. Inner secondaries and coverts like the back but with the ground a clearer buff; primaries and primary-coverts coloured like those of the male; under wing-coverts and axillaries white. Breast dull-buff, each feather subedged black, forming crescentic bars which gradually become less and less defined until they are mere dots on the stomach and thighs, and disappear altogether on the under tail-coverts and tarsi; the feathers round the vent and the extreme bases of the under tail-coverts are dull reddish-brown.

The extent of the yellow on the throat and neck varies equally in both sexes; otherwise Asiatic females vary above very little *inter se*, and this only as regards the general tone, some birds being darker than others, owing to the amount of black marking being greater, and again some birds are very lightly marked on the abdomen. Western female birds are distinguishable as easily as the males, having a beautiful vinous-pink tinge above and below with fewer black bars and spots.

The females in the Tring Museum show the differences if anything even more distinctly than the males.

Measurements.—The females average slightly smaller than the males. Asiatic specimens.—Wing 7·24 inches (= 183·9 mm.), tarsus ·87 (= ·22 mm.), and bill at point ·44 (= ·11 mm.). African specimens have these parts averaging 7·41 (= 188 mm.), 1·01 (= 25·6 mm.) and ·49 (= 12·1 mm.) respectively. Ogilvie-Grant gives the average of the wings of the females in the British Museum as 6·6 (= 167·3 mm.) only.

The Tring Museum has more African specimens of the Coronetted Sand-Grouse than the British Museum, and these have been placed at my disposal by Lord Rothschild for examination.

In 1902, Dr. Ernest Hartert described, in the bulletin of the British Ornithologists' Club for February, our Indian bird as a subspecies of *Pt. coronatus*, and gave it the name of *Pt. coronatus atratus*; and this is the name our bird will have to bear.

An examination of all the material available to me seems to show that this species is divisible into three races or subspecies.

I have examined, in the Tring and British Museums, thirty-nine Asiatic birds and fifteen African birds, besides a further considerable series in India of both sexes, for the difference in the three races is as marked in the females as in the males.

The Asiatic birds, with the exception of three from Palestine, are birds with the dominant tone on the upper plumage buff and with the dark markings very profuse, and therefore the general aspect of the bird decidedly dark.

The African birds, with the exception of one from the Nile, have the back a most beautiful vinous-isabelline tint, the markings very sparse, and the general aspect altogether paler than the Asiatic form.

A single specimen from the Nile and three specimens from Palestine are intermediate between these two races, having the upper parts vinous as in *Pt. c. coronatus* but of a deeper tint and also rather more marked with black. The bird from the Nile perhaps more nearly approximates the African specimens, whilst the three from Palestine are nearer the other Asiatic subspecies.

The African birds, as I have already said, are also decidedly larger than the Asiatic, the birds from Palestine and the Nile being intermediate in size as well as colouration. Thus, all the African birds examined have a wing averaging ♂ 7.92 inches, ♀ 7.48. The Nile and Palestine birds, ♂ 7.56, ♀ 7.31, and the Asiatic, including the Indian birds measured, which are not in the British Museum collection, ♂ 7.28, ♀ 7.05.

Ogilvie-Grant has noted in reference to the differences above referred to, "in some African specimens, the whole of the upper parts are washed with vinaceous, and the black marks and bars on the upper parts and chest are very much reduced, nearly absent on the scapulars, while the throat, breast and belly are immaculate."

Distribution.—Coroneted Sand-Grouse are found throughout North-eastern Africa from Algeria and Tunis, in the north-west through the Sahara and parts of the Soudan, Egypt, Nubia, the Eastern Soudan and parts of Abyssinia, Arabia, Palestine, Persia, Afghanistan, Beluchistan and so into India.

Within Indian limits our subspecies *atratus* is found in the extreme north-west from Fort Jamrud at the mouth of the Khyber Pass, in the North-west Provinces all along the country between the

Indus and Afghanistan and Beluchistan in that province and in Sind. Outside this comparatively narrow slip it has hardly ever been obtained, although there are three specimens in the British Museum collection obtained by Colonel Swinhoe in the Mhow district, which is in Dhar, to the south of West Central India.

Nidification.—Lieut. E. Barnes found the Coronetted Sand-Grouse breeding in Chaman in Afghanistan. In this place he flushed a pair of the sand-grouse both of which he shot, and at the spot from which he flushed them he found three eggs, unfortunately too hard-set to preserve, so we have no description of them beyond the fact that they measured 1.5 inches $\times$ 1.06 ($= 38.1 \times 27$ mm.).

There is another egg taken by the same collector which is now in the British Museum. In colour this specimen is a very pale yellowish-stone colour, rather than cream as described by Oates; the superior markings consist of small blotches, spots and specks of pale vandyke-brown, whilst the secondary or underlying spots are of pale lavender-grey. Both are fairly equally distributed over the whole surface of the egg, perhaps rather more numerous in the central portion, where they also seem to average darker in tint. The shape is, of course, the usual elliptical one of all Sand-Grouse, and the texture is smooth and fine with a strong gloss.

It measures 1.62 inches $\times$ 1.07 ($= 41 \times 27.3$ mm.) and was taken at Chaman on the 27th May, 1908. Elsewhere Barnes records the fact that these sand-grouse breed during May and June in Chaman, south Afghanistan.

Tristram found the African form breeding in the South Sahara. He says: "I found it only in small companies of four or five, but this may have been owing to the extreme scarcity of plants in the district where it roams. The egg is of an ashy-white, with a few almost obliterated pale-brown markings."

Whitaker was never "fortunate enough to discover its eggs, but apparently this species is a late breeder, and does not lay until the middle of May."

Loche states "that he has taken the eggs of this species, and that they are of a pale-greyish colour, covered with indistinct violet-grey and dull-rufous markings, and measure about 44×32 mm.; but these measurements seem more applicable to eggs of the larger species of sand-grouse."

The only other eggs I know of this Sand-Grouse are two oviduct eggs in my collection, one of which I owe to the generosity of Mr. Chas. M. Inglis. This egg is a pale-grey, or pinkish-grey stone colour, and the markings consist of small blotches of pale-sepia disposed in a thin ring at one extremity and scattered here and there over the rest of the egg. The secondary markings are of very pale lavender, and consist of blotches a good deal larger than the primary markings, though still fewer in number and confined entirely to the ring-marked half of the egg.

The surface of this egg is very smooth and decidedly glossy; the shape is the usual ellipse and it measures 41.4×27.6 mm.

The second egg was purchased by me from the Harington Bulkley collection, and all that I can ascertain is that it was obtained from the oviduct of a female shot on the 14th May on the Sind-Beluchistan frontier in the year 1890.

This is of the usual shape and character, but has a yellow-stone ground-colour whilst the markings consist of a dense ring of primary brown and secondary grey blotches round one end. Elsewhere the blotches, especially the primary or surface ones, are rather sparse.

This egg measures 39.3×26.2 mm.

General Habits.—As far as can be ascertained from the scanty records now in existence, we find that the Coronetted Sand-Grouse enters Indian limits during the latter part of October and remains until about the end of March; as, however, it undoubtedly breeds in both Beluchistan and Afghanistan, it may be found to occur in India in suitable places in almost any month of the year, even if it is never actually proved to breed in this country.

There is very little on record about this beautiful little sand-grouse as to its habits, etc. When in India, Lieut.-Colonel J. M. Anderson informed Mr. E. Oates that he "shot several *Pterocles coronatus* in October in the western desert near the hills of Karachi; they were in flocks of from six to twenty and were very tame; very different to *P. arenarius*, which was found one of the most difficult birds to approach."

St. John in the 'Ibis' for 1889 writes of this Sand-Grouse:—

"This is the only small Sand-Grouse of Southern Afghanistan, and is very generally diffused, though nowhere numerous. It is

commonly seen in small parties of a dozen or so, and is more active on the ground than other Sand-Grouse, running about and picking up seeds like a partridge, whereas *P. alchata* and *P. arenarius* are leisurely and staid in their gait.

"It breeds in the Helmund desert, for I found it common between Kandahar and the river in July."

Mr. R. H. C. Tufnell has a rather curious note on this bird's flight; he says: "Sir William Merewether tells me that the flight and cry of *P. coronatus* are quite different from those of all the other species. They have a curious fluttering flight, and appear often to hover in the air, especially before settling, and their cry is a twittering one." This, however, does not agree well with Whitaker's account of the same bird's flight. This is contained in the best and fullest account of the habits of the Coronetted Sand-Grouse I have come across, and I, therefore, though it is written of the African subspecies, quote it *in extenso*.

First in his 'Birds of Tunisia,' p. 243, he says of *P. coronatus* that it is "not at all uncommon in Southern Tunisia, and it also occurs in the Algerian Sahara and in Tripoli.

"Its range in the Tunisia appears to be confined to districts south of the Atlas, where, however, it is in some parts abundant."

Then in the 'Ibis' for 1894, Whitaker writes in the article to which I refer:—

"During my journey I met with it at only one place, viz., at Oglet, Alima . . . where it was plentiful, coming in flocks of from ten to fifty birds to drink at the water holes made by the Arabs in the dry river-beds. I saw it first on March 12th, when the flight commenced about seven a.m., and lasted till nearly ten o'clock, after which hour the birds disappeared. During the remainder of the day I only met with an occasional straggler in the plains near Oglet-Alima, and think the bulk of the birds must have gone further south towards the desert, nor did they return to drink here in the evening. The following morning, however, they were at the water-holes again in full force. They are very strong on the wing and fly at a considerable height, uttering a loud clucking note all the time, something like that of the Common Fowl. So loud is the note and so high do the birds fly, that they can often be distinctly heard when scarcely visible to the naked eye. Though very shy and difficult to approach they do not leave the neighbourhood when disturbed but return to the water-holes or their immediate vicinity till the hour arrives for

their departure. As in *P. arenarius*, their feathers lie very closely together, necessitating heavy shot to bring them down. The flesh of this Sand-Grouse is excellent eating and not at all tasteless, the breast having dark and light meat the same as the Black Game."

Later on in the same chapter he adds: "On the ground its walk resembles that of a pigeon. Its note is very different from that of the two above species (*P. arenarius* and *P. alchata*), and may be very fairly well rendered by the syllable 'Ka' or 'Kla,' repeated several times.

"In the stomachs of those which I have examined I never found anything but seeds and vegetable matter."



THE CLOSE-BARRED SAND-GROUSE

female

Pterocles lichtensteini arabicus

male

PTEROCLES LICHTENSTEINI ARABICUS.

THE ARABIAN CLOSE-BARRED SAND-GROUSE.

Pterocles lichtensteini arabicus, *Newn. Orn. Monatsb.* p. 152 (1909)
(Lahadj, S. Arabia); *Hartert, Vog. Pal.* p. 1512 (1920).

Pterocles lichtensteini, *Temm. Pl. Col.* vol. v, pls. 25, 26 (1825); *Blyth, J. A. S. B.* xxiv, p. 304; *Hume, S. F.* i, p. 219; *Wise, ibid.* iv, p. 230; *Hume, ibid.* vii, p. 162; *id. Cat.* No. 800 bis; *Hume & Marsh. Game-B.* i, p. 66; *Butler, Cat. B. of Sind, etc.* p. 52; *Tufnell, S. F.* ix, p. 202; *Barnes, B. of Bom.* p. 296; *Newnham, J. B. N. H. S.* iv, p. 53; *Laurie, ibid.* p. 94; *Ogilvie-Grant, Cat. B. M.* xxii, p. 29; *Oates, Game-B.* i, p. 51; *Ogilvie-Grant, Game-B.* i, p. 20; *Le Mess. Game-B.* p. 57; *Blanford, Avifauna of India*, iv, p. 57; *Stuart Baker, J. B. N. H. S.* xxii, p. 653.

Pteraclis lichtensteini, *Sharpe, Hand-L.* i, p. 51.¹

Vernacular Names. None recorded.

Adult Male.—The forehead with three bars of black and white as in *fasciatus*, but the front white bar runs up and back into the black, and the black in the same way into the posterior white band, so that the two front bands are more or less V-shaped, whilst the third band is generally interrupted in the middle; this is also produced backwards as a broad short supercilium, with a black eyebrow-patch in the centre. The blackish band is also often extended from its posterior base as a fine line under the eye and over the ear-coverts. Rest of the head and neck isabelline-buff, each feather with a black central mark, long and forming streaks above, but reduced to spots below; the chin and centre of the throat often immaculate in old birds and, in colour here, a purer buff. Remainder of upper parts very pale buff closely barred with wavy black lines, the upper tail-coverts more boldly barred and ochreous-buff at the tips; tail-feathers barred buff and black, the bars broadening towards the ends, which are again widely tipped a richer buff. Scapulars and inner secondaries like the back, but more boldly barred and with ochreous-yellow tips; lesser coverts like the back; secondary- and median coverts pale clear buff, in some cases almost white, barred with black and tipped yellow; bastard-wing, primary-coverts and primaries brown, edged paler.

Under aspect of the wings and axillaries pale-grey. Upper breast barred buff and black; lower breast a rather rich yellow-buff, divided in the centre by a band varying from a chocolate-chestnut to black and followed again by another black band, generally much broken and mixed with white. Abdomen, vent and external flanks white, each feather with two half-moon-shaped bars, the terminal being black and the lower concealed one chocolate; under tail-coverts pale buff with arrow-shaped bars of black or deep-chocolate; feathers of tarsi white to pale-buff.

The above description gives most of the details in variation of colour, but it may be noted that the bird varies in general tone of colouration from a pale sandy-buff to a richer, almost chestnut buff, more especially on the scapulars and upper back.

The bird from which the plate is taken is a very typical Indian specimen, but in a good many the upper parts are slightly richer in colour.

The colour of the breast also varies somewhat, and in a few birds the part above the central band is slightly suffused with vinous, but I have never seen the upper and lower parts contrasting with one another as is often, generally in fact, the case with *fasciatus*.

Measurements.—Wing 6·85 inches (=171 mm.) to 7·35 (=186·6 mm.) with an average of 7·06 (=179·3 mm.), tarsus ·91 (=23·1 mm.) to 1·10 (=27·9 mm.) the average being exactly 1·0 (=25·4 mm.), bill from tip along culmen to feathers of forehead ·46 (=11·6 mm.) to ·52 (=13·2 mm.) and averaging ·49 (=12·4 mm.) full, tail from vent about 3 (=76·2 mm.) or a little over.

“Total length 10·3 inches, wing 7, tail 2·8, tarsus 1·1.” (*Ogilvie-Grant*.)

Colours of Soft Parts.—“Legs wholly feathered in front; feet orange-yellow; reticulations white; claws dusky, tipped yellowish; bill fleshy-brown, darker in the female; irides brown; orbital skin yellow.” (*Hume*.)

“Iris brown, orbit lemon-yellow, bill orange-brown, feet orange-yellow.” (*Blanford*.) “Feet chrome-yellow.” (*Sharpe*.)

Adult Female.—The female has the whole head and neck pale earthy-buff spotted with black, these spots becoming streaks on the upper part, very fine lines on the lores and ear-coverts and fairly

isolated spots below. The whole of the upper parts and wing-coverts are finely barred pale earthy-buff and black, the median and greater coverts tipped narrowly with pale yellowish and the outer webs of the outer coverts with narrower black bars and more proportionate pale buff, generally of a lighter, purer tint than that of the back. Greater coverts and primaries like those of the male; under wing-coverts grey, obsoletely barred darker; whole lower surface and flanks barred black and white, the latter purest on the abdomen and buff on the breast; on the under tail-coverts the bars are broader and the tips are yellowish; feathers of tarsi pale buff.

The female varies to the same extent as the male in general tint; the bird shown in the plate representing an average bird, whilst some may range a good deal paler and sandier and others richer with more of a rufous tint.

Measurements.—The wing of the female measures between 6·55 inches (=166·3 mm.) and 7·10 (=180·3 mm.) with an average of 6·85 (=176·5 mm.), the tarsus between ·86 (=21·8 mm.) and 1·0 (=25·4 mm.) with an average of ·93 (=23·6 mm.), the bill between ·50 (=12·7 mm.) and ·55 (=13·9 mm.) with an average of ·52 (=13·2 mm.), the tail about 3 (=76·2 mm.) or rather less.

It is on an average, therefore, a decidedly smaller bird than the male, but judging from the small series I have been able to examine, the bill is longer, though more slender. Hume's measurements refer to one pair of birds only, but he gives the weight of both male and female as eight ozs.

Distribution.—The home of this little sand-grouse is Abyssinia, Nubia, Egypt in the extreme south, and South Arabia. Thence it extends east through South Persia, Beluchistan and South Afghanistan into Sind. The most northern record in Persia I can find is that of a bird from the Tigris, north of the Persian Gulf, and it seems also not to be found much north of Mecca or Jeddah in Western Arabia, though it thence works north and east round the Persian Gulf.

Within Indian limits the Close-barred Sand-Grouse has only been obtained in Sind, west of the Indus, from Gul Mahomed, Mehar, Upper Sind, where Hume first came across it, to Karachi in the extreme south.

Hartert says that it has been taken at Muscat and at Aden.

Nidification.—There is hardly anything on record about the breeding of this sand-grouse, although it must breed practically throughout its range. Ogilvie-Grant, in his 'Game-Birds,' quotes Heuglin to the effect that he found nests of this species containing "two cylindrical eggs, much the colour of dirty and faded Pewits' eggs."

There is one egg of this species in the British Museum collection taken at Moraul, by Malan, in 1851. In ground-colour this is a dirty yellowish stone-colour, or earth-colour, and it is rather profusely covered all over its surface with largish blotches of dull vandyke-brown and with others again underlying these of dull lavender-grey. It is of a dull, glossless surface, with a texture comparatively rough to both touch and sight. In general appearance it is like a small, pale and very dull-coloured egg of *Pterochlorus alchata*, but it can be matched by no egg I have seen in very large series of the latter, and its texture is totally different.

It measures 1.70×1.20 inches ($= 41 \times 27.3$ mm.). There is no date given to show in what month it was taken. It came to the Museum with the rest of the Crowley Bequest and in the Crowley Catalogue there is the following remark: "One egg from Minereh. Revd. S. C. Malan, *ex* Tristram, 'Tristram says the species is not quite certain.'"

General Habits.—They are, of course, only winter visitors in India, occurring some years in fair numbers, whilst in others very few, if any, visit this country at all. They appear never to arrive before January and all leave again before April, the majority in early March. Hume says of these birds: "With us they are generally met with in pairs or parties of three or four, in the neighbourhood of some little patch of cultivation, or where broken, rocky ground or scrub afford some kind of cover. They lie well and though they fly fast enough, like all their congeners when well under way, rise an easy shot."

There is practically nothing else on record about this sand-grouse in India, and Blandford in his *Geology and Zoology of Abyssinia* gives the best description extant of the habits of the southern form of this little sand-grouse (p. 419 *et seq.*):—

"This bird has precisely the same habits as the closely allied *Pt. fasciatus* of India. It is rarely if ever seen on open sandy plains; like *Pt. fasciatus*, it keeps to bush and thin tree jungle, and is usually found solitary, in pairs, or at the most two or three pairs together. I once came upon a considerable flock in January, and possibly at that time these birds may collect in large numbers; but in May, June, July, and August, it was rare to see more than four together, except about watering-places. When disturbed, the Sand-Grouse rises with a sharp cackling cry, affording a very difficult shot. It does not rise high, and usually settles again after a short flight. All kinds of *Pterocles*, as is well known, fly to water at particular hours in the day, the hours varying with different species. *Pt. exustus* drinks about 9 a.m. and 4 p.m. In the present case the drinking hours are at daybreak, in the morning, and at dusk in the evening, as is also the case with the Indian *Pt. fasciatus*, the crepuscular habits of which are mentioned by Jerdon ('Birds of India,' vol. ii, p. 498), and have been noticed by myself also. In the semi-desert country West and North-west of Massowah, in which *Pt. lichtensteini* abounds, and there are but few places where water is found, the scene at each spring of an evening after a hot day especially is very interesting. At Saati, Ailat, and Ain, there was a constant rush of these birds from sunset till dark, and again in the morning before sunrise. Singly and in small flocks, uttering their peculiar 'queep-queep' like note, they flew up and down the water-course on their way to and from the water, keeping only a few feet above the bushes and low trees; the noise of their wings being heard in the dusk before the birds themselves appeared. Like all other Sand-Grouse, they are excellent eating, the flesh being rather hard but of delicious flavour; and our party used generally to shoot a few each evening, not an easy matter, for the great swiftness and power of wing possessed by these birds rendered them, in the dusk especially, by no means an easy shot.

"*Pt. lichtensteini* appears entirely confined to the tropical coast region. At some water in the Lebka Valley at Mohabar, only 2,000 feet above the sea, scarcely any come to drink in the evening, and at higher elevation not any were met with."

Occasionally, at all events, the Close-barred Sand-Grouse collects in flocks of some size, for Yerbury ('Ibis,' 1886), speaks of finding "a flock of eighty to a hundred individuals" at Shulaif near Lakey.

Genus PTEROCLURUS.

The genus *Pteroclorus* is, as I have already said, scarcely worthy of division from *Pterocles*, the only difference being that the central tail-feathers of the former genus are produced in long filaments beyond the other rectrices, whilst those of the latter are normal.

There are altogether four species in this genus, which have further been divided into subspecies. Three species are found in India, of which one, *senegalensis erlaangeri*, is a permanent resident, one, *alchata*, is, practically if not wholly migratory, and the third, *senegallus*, very rarely breeds within Indian limits.

Key to the Species.

- A. Lower plumage from breast pure white *alchata*.
- B. Lower plumage marked with black.
 - a*. Middle of abdomen barred black and rufous *senegalensis*.
 - b*. Middle of abdomen black.
 - a'*. Black gorget across breast *senegalensis*.
 - b'*. No black gorget across breast *senegallus*.



THE LARGE PIN-TAILED SAND-GROUSE

male	<i>Pteroclorus alchatus caudacutus</i>	female
	$\frac{1}{2}$ life size	

PTEROCLURUS ALCHATUS CAUDACUTUS.

THE LARGE PIN-TAILED SAND-GROUSE.

Tetrao alchata, Linn. *S. N.* i, p. 276 (1766).

Tetrao caudacutus, *S. G. Gmel. Reise*, iii, p. 93 (1774).

Pterocles alchata, Blyth, *Cat. B. A. S.* p. 249; Jerdon, *B. of Ind.* iii, p. 500; Hume, *S. F.* i, p. 221; Blewitt, *ibid.* iii, p. 268; Hume, *Cat.* No. 801; Blanford, *E. Persia*, ii, p. 271; Hume, *S. F.* vii, p. 161; Hume & Marsh. *Game-B.* i, p. 77; Butler, *Cat. B. of Sind*, p. 53; Barnes, *B. of Bom.* p. 297; *id.* *S. F.* ix, p. 458; Le Mess. *Game-B.* p. 58; Oates, *Game-B.* i, p. 23; Bogle, *J. B. N. H. S.* xii, p. 529; Nurse, *ibid.* xiv, p. 388.

Pteroclorus alchata, Ogilvie-Grant, *Cat. B. M.* xxii, p. 7; Blanford, *Avifauna B. I.* iv, p. 58; Stuart Baker, *J. B. N. H. S.* xxiii, p. 2; Magrath, *ibid.* xxv, p. 149 (1917); Thornhill, *ibid.* p. 486.

Pteroclidurus alchata, Sharpe, *Hand-L.* i, p. 50; Oates, *Cat. Eggs B. M.* xi, p. 75.

Pterocles alchata caudacutus, Hartert, *Vog. Pal.* p. 1506 (1920).

Vernacular Names. None recorded.

Description. Adult Male.—Centre of crown and nape grey, more or less tinged with ochreous; forehead, lores and sides of head rich rufous-buff shading into ochreous on the neck all round. Chin and throat black and a narrow line of the same running from behind the eye nearly as far as the nape. On the back the ochre of the neck merges into olive-ochre, a few of the feathers here and most of the scapulars with a yellow subterminal spot and all margined with grey; lower back and rump yellow-buff barred with black, upper tail-coverts even more yellow and the bars forming arrow-heads on the longest. Tail barred blackish and buff at the base, becoming dark olive-ochre at the tip and almost black on the prolonged portion; the outer tail-feathers are tipped yellow and subtipped dark blackish. Lesser, median and secondary-coverts white with broad bands of bright chestnut-chocolate near the tips and with black edges; shoulder of wing, bastard-wing, primary-coverts and primaries grey, the last named darker on the inner webs and

marginated white, the outer web of the first primary and all the shafts black; outer secondaries blackish-brown with bases white and edged with same; innermost secondaries like the scapulars; secondary-coverts, where visible, yellow-ochre with blackish-chocolate terminal bands. Breast pale pinkish-rufous, divided from the yellow-ochre of the neck and the white of the lower breast and abdomen by narrow black bands; flanks, axillaries, lesser and median under wing-coverts, and under tail-coverts white; under shoulder and edge of wing dark-grey, greater under wing-coverts pale-grey.

When once fully adult the males do not vary much in tone of colouration, but the number and size of the yellow spots on the scapulars and adjoining parts do vary to a considerable degree, and when these are unusually numerous they give a very bright boldly-coloured appearance to these parts, and, on the contrary, give a dull rather dark appearance when they are few and small.

Below, the rufous breast-band varies a little in intensity and in the amount of pink, otherwise the lower parts are very constant.

Measurements.—Wing 7·98 (= 213·6 mm.) to 8·40 inches (= 224·2 mm.) with an average of 8·25 (= 220·8 mm.), tarsus 1·00 to 1·12 (= 25 to 28·5 mm.) and averaging over 1·06 (= 26·75 mm.), bill at front ·50 to ·58 (= 12·5 to 14·6 mm.) and averaging rather over ·53 (= 13·5 mm.), the tail varies from about 5·50 (= 140 mm.) to 7·50 (= 190·5 mm.).

These measurements are taken from a series of over a hundred skins, the very great majority of these being birds shot in India. They include the series in the British Museum and in the Tring Museum.

Males.—“Weight 10 to 12 ozs.” (*Hume.*)

Colours of Soft Parts.—“The feet are dirty or dusky-green, in one specimen yellowish; the irides are brown, the bill varies in colour somewhat; and I have recorded it in different specimens, as dusky-green, greenish-brown, brown, dark-brown, slate-colour.” (*Hume.*)

Adult Female.—Whole upper parts from forehead to tail buff-barred with black; on the shoulders and interscapular region the tint is often somewhat rufous and that on the upper tail-coverts brighter and more yellow. On the interscapular feathers a few of the broadest bars of black have their centres grey. A short supercilium,

lores and edge of forehead, sides of head and the neck rufous like those parts in the male but paler and duller; chin and throat white in the centre; a fairly well-defined black line from behind the eye. Scapulars and innermost secondaries like the back, but the bars wider and bolder and with more grey and with the ends yellow-ochre narrowly edged with black. Primaries and their coverts like those of the male. Secondary, greater and median coverts white with rufous subterminal bands and black edges, the bases, where covered, barred rufous and black; outer secondary-coverts and median primary-coverts with broad white terminal bars edged black. Below the rufous of the fore-neck there is a wide collar of black followed by a narrow fringe of the same colour as the neck, which merges into grey and is then followed by another narrow band of black. From this band the colours are as in the male, a broad band of rufous, a narrow band of black or very deep chocolate, and the rest white.

The females, when adult, differ to much the same extent as the male underneath, but above the range of variation is considerably greater, some birds being much more boldly and richly marked than others, and the amount of yellow markings and the extent to which the slate-grey bars take the place of the black on the scapulars and the dorsal region is variable.

Measurements.—Wing 7·65 (= 194 mm.) to 8·30 inches (= 230·8 mm.) with an average of 7·99 (= 202·9 mm.), tarsus about ·97 (= 24·5 mm.) and bill at front about ·49 (= 12·6 mm.) The tail averages a good deal shorter than the male, the longest I have seen being 6·2 (= 157·2 mm.), whilst many are well under 5 (= 127 mm.).

Females.—“Weight 8·25 to 11·25 ozs.” (*Hume.*)

The colours of the soft parts are the same as in the male.

Immature Male.—In males not yet fully adult much of the barring of the upper parts as in the female is still retained, the head is wholly barred, the chin and throat white and the fore-neck dull olive-buff with large black spots. The black of the throat is acquired in patches, and finally the well-marked crown, etc., of the adult male, though birds, otherwise fully adult, may be found with a few barred feathers on the upper head.

Plumage of young female.—Chin and throat white; whole upper

surface barred buff and blackish, duller on the dorsal parts, brighter on rump and tail; wings with the white on the coverts replaced by grey, the slate-grey bands replaced by black, and the whole tone duller and greyer. The sides of the head, neck and breast are dull earthy-buff with bars of black, these bars are rather denser on the base of the throat and above the white of the abdomen, giving slight indications of the bands on these parts; the under tail-coverts are white with a few brown bars and the rest of the under parts white as in the adult, but with obsolete brown bars here and there, especially in the centre of the abdomen.

First plumage of both male and female.—Whole upper parts, head, neck and breast dull-buff, barred with blackish and brownish-black above and dull-brown below. Chin and throat white as in the older female. The bars on the head and lower parts are narrower and more numerous than in the older bird and are more crescentic in shape. The quills are paler and the inner primaries freckled with rufous towards the tip. The wing of a bird of this description measures 7.02 inches.

The nestling has not yet been described, but in the P.Z.S., 1866, there is a plate (ix.) which shows the general colour to be reddish-brown above, profusely spotted all over with black and with scattered apical spots of white. Lines on crown and sides of head from bill, down the centre of back and horse-shoe shaped on mantle are white with black edges and there are two small similar horse-shoes on wings.

Mr. Meade-Waldo was the first to discover that the male of this Sand-Grouse assumes a post-nuptial plumage after the young are hatched, much in the same manner as many ducks do. He says: "Roughly, there is the first nestling-plumage which is assumed from the down. This is moulted in the autumn into the winter plumage. In the very early spring this again is changed into the breeding-plumage, and the cock in late summer puts on an eclipse dress resembling the hen, except that the slate-blue bars on the back are missing. As far as I can ascertain these changes are brought about by a complete renewal of feather and all are complete, but the eclipse plumage is only perfect in adult and vigorous birds, otherwise the feathers that are first shed partake of the character

of breeding-plumage and eclipse and those last moulted of eclipse and winter-plumage."

Distribution.—The area of distribution of our Indian bird extends from the north-west of India, through Beluchistan, Afghanistan and Persia, across the Caspian Sea and the Caucasus Mountains into the South Russian steppes and throughout Eastern Asia Minor, and again due west through Southern Persia and Arabia into Northern Africa, through Abyssinia, Nubia, Egypt, the Sahara and as far west as Morocco.

Within Indian limits the Large Pin-tailed Sand-Grouse occurs in enormous numbers in the north-west and Sind in the Trans-Indus country; in great numbers also in the Punjab between the Indus and the Chenab, after which it becomes less common towards the Gara and the Beas, though still constantly and regularly met with; from here it extends through the Punjab, having been found in Ludhiana, and Delhi in the extreme east. In the south, Hume obtained it as far as Sambhar in Rajputana, and I have notices of its occurrence from Jodhpur and Bikanir, and Major C. G. Nurse, in 1902, recorded it from Deesa, still further south than it had been previously obtained. This last bird was shot by Captain L. Oldfield, R.F.A., who obtained one specimen out of a flock of twenty or twenty-five birds.

Nidification.—The Large Pin-tailed Sand-Grouse does not regularly breed with us in India, though it has done so on rare occasions, and may, quite possibly, be often found to do so; otherwise it breeds in suitable localities throughout its range.

The first egg of this species taken in India is one now in the British Museum, which was found at Jhimpir in Sind on the 10th July, 1878. After this, nothing else was recorded until Mr. Bogle wrote the following interesting note to the 'B.N.H.S. Journal,' which I quote *in extenso*, merely noting that it was written from Mardan in the Punjab.

"I cannot see, either in Oates, Jerdon, or Hume and Marshall any record of the Eastern Pin-tailed Sand-Grouse, *Pterocles alchatus* breeding in India, which I think I may claim to have proved breeds in the Peshawar Valley. Two days ago, eggs were brought to me by a man, who declared one was that of the Common and the other that of the Pin-tailed Sand-Grouse. Doubting his word I made

arrangements to go out this morning, 10th June 1900, with him, and see if I could gather any information myself. I first went to the place where these Sand-Grouse water, where I found, close to a small village called "Kasim" the Common Sand-Grouse fighting in packs and a very few pairs, while to my surprise the Pin-tails all came in pairs (I saw five or six pairs). I shot one pair of the latter and then proceeded to search a few miles further on in a vast open plain for nests. I found only two nests, each containing three eggs of the Common Sand-Grouse. In each case I approached so close to the bird in the nest that there was no necessity to shoot it in order to identify it. On my return I dissected the female Pin-tailed Sand-Grouse and found an egg inside quite ready for laying, and I have no doubt that it would have been laid to-day in the same plain I was searching in had the bird lived.

"I regret to say the egg was broken badly, first pierced by shot and again broken in extraction."

Salvin describes these birds as breeding in the Atlas, and says, "The extensive sandy plains termed the Harakata, of which El Korarf is one of the largest, are the only localities in which we met with the Sand-Grouse. It makes no nest, but scrapes a slight hollow in the sand, in which it deposits its three eggs. These are laid in May, the young being hatched about the second week in June."

I have a really magnificent series of the eggs of this sand-grouse taken in the Tigris Valley, and given me by Captain Pitman, whose notes I freely quote further on.

These eggs, which are selected from a still greater number, form a series of 100 eggs, the great majority full clutches of three eggs each, a few pairs, and a few more single eggs.

The nests consisted of mere depressions scratched by the birds in the earth, and with no lining other than a casual scrap of grass accidentally placed therein and, as a rule, not even this was present. Unlike *senegallus*, which selects the barest places, generally the baked mud-flats, the Large Pintailed Sand-Grouse breeds on the desert in places where there is a certain amount of grass, thin vetch or the *Polygonum* on which they so largely feed. Although they can hardly be said to breed in colonies in the way gulls and terns breed, yet vast multitudes breed in the same area, nests in many cases being only a few yards apart. During June and July 1916, great areas of scrub and self-sown crops were accidentally burnt, and dozens of

nests in quite small areas were then visible at a glance, the half-roasted clutches of eggs showing up very white against the charred and blackened background. The nests are not as a rule placed directly under the shelter of bushes, clods of earth, &c., nor are they ever placed in really thickly-growing scrub or crops, though many nests were placed in thin grass, or weedy, self-sown grain. Captain Pitman describes the country round the camp referred to in his notes as "one huge breeding-ground," and thinks that the enormous south and south-east migrations which he noticed in March, 1916, further north, represented movements of the birds to this breeding-ground.

Apparently the breeding-season commences in early May and extends to early July, the great majority of eggs being laid the last week in May and the first fortnight of June. At the same time a few birds may lay in the last week in April, and I have one clutch taken in Mesopotamia on the 10th July.

The eggs of this fine sand-grouse differ from those of all others in their richness of colouration and boldness of marking. The normal ground-colour is a clear, rather bright buff, and they vary in this from a pale-yellowish or creamy stone-colour to a quite rich buff. A few eggs have the yellow or buff tint wanting and are an almost grey stone, whilst a few others are nearly salmon-pink or rich buff-salmon in general tint. The primary markings consist of bold well-defined blotches of dark vandyke- or reddish-brown, interspersed with smaller spots and specks of the same colour. The secondary or subordinate markings are of the same character but of light-grey, pale and dark neutral-tint, and a few of deep purple-grey. Both primary and secondary markings are fairly equally distributed over the whole surface of the egg, in very rare instances being denser in the middle or at one end. In one egg only have I seen the markings practically confined to one end, and in this they more or less blend into a reddish cap with darker blotches showing through.

The surface is fine and smooth with a well-developed gloss, and the shell is fairly stout.

In shape the eggs are elliptical, as in all sand-grouse, and the measurements of 100 Mesopotamian eggs are as follows: Average 45.0×30.4 mm.; maxima 49.9×29.9 mm., and

40·1 × 33·3 mm.; minima 39·6 × 28·3 mm., and 46·1 × 28·0 mm.

General Habits.—When in India it assembles in enormous flocks, literally in thousands, and in the more eastern portion of its habitat this seems to be generally the case, indeed some people consider this sand-grouse to have been the quail provided for the Israelites; further west, however, it does not seem to collect in nearly such large flocks.

Hume is the only writer who has given us an account of this bird's habits in India and his remarks are to the following effect:—

“I have seen very little of this species myself, and only on a vast plain some miles from Hoti Mardan, where during the winter, they were in tens of thousands. This plain is partly barren, partly fallow, and partly cultivated with wheat, mustard, and the like. It was only on the barren and fallow land that I saw them. They are extremely wary, and it was only by creeping up a nala or small ravine that it was possible to get within even a long shot of them. Their flight is extremely rapid and powerful, to me it seemed more so than of any of their congeners.

“They are very noisy birds, and whether seated or flying, continually utter their peculiar cry, which, though somewhat of the same character as that of *arenarius*, is unmistakably distinct from the call note of any of the other species.

“Those I shot, and, according to their account, most of the large series previously shot by my collectors, had fed entirely on green leaves, seeds, small pulse, and grain of different kinds. The gizzards contained quantities of small stones. There were several pools and places where the rain floods had not quite dried up, on the plain I have referred to, and the birds seemed to sit about much in their immediate neighbourhood.

“One or two of my birds were very fat, so much so that it was difficult to skin them, but as a rule, when cooked they were as dry and tasteless as the rest of the Sand-Grouse.

“I was told that they were occasionally hawked with Shaheens, but their flight is so rapid and powerful that I should doubt much sport being obtained this way. I was also told that they could be shot by working a couple of Peregrines over them, when they allow a very close approach and almost refuse to rise.”

This account agrees well with Whitaker's account of these birds in Tunis as seen by him at one of their favourite watering-places. He says:—

"In many of its habits the Pin-tailed Sand-Grouse resembles the preceding species (*P. arenarius*), though differing in others. It is, as a rule, found in much larger flocks than *P. arenarius* and is said never to approach the sea-coast. Like that bird, however, it is very wild and shy and when disturbed, generally flies for a great distance before settling down again, although should it be its hour for drinking, and its thirst not yet be appeased, it will often make one or two attempts to return to the water before finally leaving the spot.

"Such of the *Oueds* as may still have some water in them in spring, or even the holes scooped out of the river beds by the Arabs for the purpose of providing themselves and their flocks with water, are sure to be visited by Sand-Grouse for drinking, and it was once my good fortune to see no less than three alternative species of these birds frequenting one of these spots at the same time, and to witness flock after flock of each come down to the water during the hour or two the flight lasted.

"*P. arenarius* and *P. alchata* were well represented on this occasion and about equally numerous, as shown by specimens obtained of both, but a third species was also present, of which I failed to secure an example, but which, judging from its appearance on the wing, appeared to be *P. coronatus*.

"The morning flight of Sand-Grouse for the purpose of drinking commences soon after sunrise, and is generally continued for an hour or two, or until the sun is well up when it entirely ceases. During the time the flight lasts the spot visited by the birds, particularly should it be one where water is abundant, presents a most animated scene, the air being full of small flocks hurrying to and from the sandy banks, the sandy parts of the river bed being in some places thickly covered with them, while the chorus formed of many hundreds of clamorous bird voices creates quite a babel of sound.

"The food of this species consists chiefly of the seeds and tender parts of various desert plants. Its note is a ringing *catarr* or *quettarr*."

In the 'Zoologist' of 1896, p. 299, and the 'Field' of August, 1896, Mr. Meade-Waldo first gave an account of the breeding of *Pteroclorus alchata* in confinement and described how the male, after the young were hatched, would "rub the breast violently up and down on the ground," a motion quite distinct from dusting, and when all awry would get into his drinking-water and saturate the feathers of his under parts. When soaked he would go through the motions of flying away, nodding his head, etc. Then, remembering

his family was close by, would run up to the hen, make a demonstration, when the young would run out, get under him and suck the water from his breast."

In a longer account in the 'Avicultural Magazine' for 1906, p. 219, Mr. Meade-Waldo gave yet further details of this curious habit, together with other most interesting details. He writes:—

"Incubation lasts from twenty-one to twenty-three days, the hen sits by day, the cock taking her place by night, usually going on the eggs about 5 p.m.; three eggs are a full clutch. The young when hatched quickly become independent, and about the tenth day separate at night, roosting away from their parents, and as far as possible from each other, not settling down to their final roosting-place until it is almost dark. Both parents brood the young when they are very small.

"The extraordinary method employed by the parent male Sand-Grouse of conveying water to their young by saturating the feathers of their breast, was first described by me in 1896, and since by Mr. St. Quintin in his interesting account of the successful rearing of the Lesser Pin-tailed Sand-Grouse, *P. exustus*. I have had the good fortune to see the males of *Pterocles arenarius*, the Black-breasted Sand-Grouse and *Pteroclorus alchata*, the Greater Pin-tailed Sand-Grouse getting water for their young in a wild state, but, had I not seen it administered in confinement, would have considered them to have been demented birds trying to dust in mud and water, when unlimited dusting ground surrounded them on every side.

"In very waterless districts, where the only water procurable was from deep wells situated at great distances from one another, this method of procuring water must be most precarious, for I saw *P. arenarius* waiting by the wells and going to the muddy spot where the skins used to be laid before being loaded on to the camels, and where the water was slopped over from the troughs where the animals drank. I also saw them fly over the prickly Zareba surrounding the tent-villages and go to where there was a soft spot for the same purpose. I did" [not?] "see *P. alchatus* actually soaking themselves, they were much wilder, and also in less arid places, but I repeatedly saw cocks pass over, their white breasts soaked in mud and water."

Captain C. R. S. Pitman, who observed this bird very closely in Mesopotamia during the campaign of 1916-17 writes:—

"About the question you ask me as to *P. a. caudacuta* giving their young ones drink during the breeding season. I often tried to watch the young ones both when newly hatched and when older but

had no luck and never saw them drinking as Meade-Waldo describes. On the other hand, I have succeeded in rearing a large number of the chicks and I found them to be very thirsty little creatures, drinking greedily more than once in the day when they got the chance. I have watched this Sand-Grouse drinking in their thousands in June and July, and I have noticed that the birds go right out into the water and thoroughly soak the whole of their body plumage underneath so much so that it is perfectly noticeable when the birds are on the wing flying back from watering, as their breasts and bodies are bedraggled and muddy. It would seem therefore that their habits here agree in this respect with those in Africa."

Colonel Magrath found that these birds when drinking sometimes actually settled on the water—and he says that a pair so settled on the Tigris right in front of him. He remarks that "when on the water they floated high and looked like gulls." This curious habit was also noticed by Captain Thornhill in Mesopotamia.

In the 'Avicultural Magazine' for February, 1910, Mr. Meade-Waldo describes how he kept a female bird of this species in confinement for seventeen years, so that she must have been at least eighteen years old at the time of her death. She bred regularly year after year from 1893 to 1906, and generally succeeded in bringing up her young. Mr. Meade-Waldo tells us that with other food, he gave her as much hemp-seed and maw-seed as she liked, and that the latter was her favourite food.

This bird occurs in enormous numbers over the greater part of Mesopotamia, but it wanders backwards and forwards from one area to another in the most extraordinary manner, and it is really most difficult to say exactly what factors govern these local migrations. Captain C. R. S. Pitman, who has compiled some most interesting notes for me, thinks that food and rainfall are the two dominating reasons for these movements, but can lay down no definite rules about them.

His notes are as follows:—

"When I returned to Mesopotamia at the end of 1916, I again saw these birds during the voyage up-stream directly we had passed Amarah. We had one or two small shoots on the way up to Sheikhsaad, and each morning and afternoon any quantity of the birds used to water from the sand-banks in the river. On 6th November I arrived back in the area twelve to fourteen miles north-

east of Kut on the right bank of the Tigris. Our camp, a small one, was on the site of an old transport camp many acres in extent and a small water-cut went through the place, the water pumped up from the river losing itself in the open plain about 2,000 yards south of our camp, where this overflow had formed a small marsh. The conditions for enticing and keeping myriads of sand-grouse in the vicinity of our camp were ideal, and the daily routine of these birds easy to study. In October it is still fairly hot, and the birds would start feeding out in the plain about dawn or a bit later, on the seeds of a small shrub which grows in profusion on the edges of marshes (usually dry in the summer), water-cuts, nullahs which are flooded in the winter, and on country liable to be flooded in the wet season. Having pretty well filled their crops with these small, soft seeds, they went off to the jheel to water, a few starting at 8 o'clock, but the majority came along from 9.30 till 10 o'clock and even later, and after having drunk their fill would proceed to flight to the site of the old transport-camp in their thousands to pick up the grain which had been dropped about and buried in the dust. The majority of the birds returned to the jheel for another drink between 12.30 and 2 p.m., but a certain number used to stop on until after 3 p.m., which was their latest hour with us. Having watered at the marsh, the birds then fed for a time on their wild food-plant before finally packing for the night, which they usually did in immense packs any distance from a mile to two miles west of the water. The area to the east and south was probably too disturbed, being nightly frequented by Arab raiders. It was curious to see the amount of water which poured out of their mouths when birds fell to the ground, shot as they were winging their way into our camp. Their crops were usually tightly packed with food, and often burst from the force of their impact with the ground. I particularly noticed that *P. senegallus*, on the other hand, did not usually have much in their crops before they came to water in the morning.

"In the camping-area the birds were ridiculously tame, hardly troubling to get out of one's way; in fact they were tame to foolishness, because it was not until they had been harried for the best part of a month or more that they began to get really wild. Even then they still continued to water at the same place, after which they would disperse east and north in great packs, which would return between 2.30 and 3.30 and later still during the latter half of November. When feeding in the camping-areas these birds were exactly like barn-door fowls, and preferred the heaps of litter which lay out drying near the incinerators, but when disturbed, or with no visible reason at all, it was extraordinary the way a pack of some hundreds would suddenly rise as a single bird.

"In October, and even as late as the latter half of November, I

used to see many family-parties of two adult and one, two or three yearling birds feeding together. The majority of the birds which remained in the vicinity of camp after 2'0 p.m. appeared to be adult birds. Adult birds are very noisy and pugnacious when only wounded and they are very tenacious of life, which I am afraid causes a great many birds to die a lingering death, although there are always numerous birds of prey near by only too ready to complete the work of the gun. The method of watering on the jheel reminded me of a living cyclonic formation—a cloud of thousands and thousands of birds wheeling in the air above and a huge incessant moving funnel of birds going down to the water and rising again, whilst hundreds remained standing in the water drinking. So thickly do these birds pack that once, when hard up for cartridges, I blazed off two barrels into one of the smaller masses of birds, and picked up twenty-four.

"During the fortnight from 12th to 25th November, we had several excellent shoots from butts which we erected around this marsh (a few acres in area) and the biggest bag was 273 birds—the number of guns used to vary from four to eight, but the more one shot this place, the more birds appeared to water there each morning. Round this marsh once the birds, really getting thirsty, began to come in and were well on the move, the fun became fast and furious, and one would get every type of shot imaginable. I have seen birds coming along nicely overhead, drop like a stone as one's gun went up, turn on to their backs and twist away at any conceivable angle. I did not notice the angry cry of *twoi twoi* so often uttered in the hot weather, but only the *caa*-ing note. No matter how long one stayed over the water the birds refused to be driven off, and immediately one moved away they came down again in their myriads. In the middle of October I saw a Pale? Harrier stoop at a squatting yearling bird a stone's throw from our camp, completely dazing it but failing to get it away. I picked the bird up and found it uninjured. Hen Harriers are always in the offing while one is shooting, and often try and carry off wounded birds or distant kills, and Eagles are almost as bad. These Sand-Grouse are evidently subject to fits, as the following incident shows. Two officers had been out shooting and as they returned to camp they saw a Sand-Grouse on a dung heap suddenly fall over on to its head with wings outstretched and fluttering. It staggered up on to its feet, and again fell on to its head, and then on to its side and apparently expired. An orderly picked the bird up, and while it was being examined, it suddenly recovered and flew away, flying strongly. It may, of course, have been previously pricked in the head by a shot.

"In shape, especially on the wing, they seem to be strikingly different to *senegallus*. The wings are comparatively shorter,

broader and more rounded. The pintails are very conspicuous, the body is shorter, or apparently so, and much deeper; not nearly so thickly feathered as *senegallus*.

"For eating purposes I far prefer *senegallus*, but its skin should be removed, as it is as tough as leather.

"While I was in a camp on the river at the end of November, I used to notice big packs on the move as early as 7'0 in the morning, and wondered what was the attraction there to bring them out at such an hour, which is unusual. They may have been worried birds changing their habits to suit the occasion, for during the last three weeks of November, troops and guns were almost daily firing into their night and watering haunts for three or four hours after dawn, and so scattered the birds far and wide.

"In October, 1916, the Divisional Commander in whose area these myriads of birds fed and watered, instituted two close days in the week when no shooting at all was allowed, the main reasons being that cartridges were scarce and so a great deal of 'pot' shooting was indulged in, and also that the daily and incessant firing might scare away the birds for good and all, as they could always water at the river.

"In addition to this, a strip of ground above the river bank (Tigris) was turned into a sanctuary, where shooting was never allowed."

Specimens of the plant on which these birds principally feed were sent to me by Captain Pitman, and very kindly identified for me by Mr. W. G. Craik of the Royal Botanic Gardens, Edinburgh, as *Polygonum argyrocoleum*; he also succeeded in growing plants from the seed sent.



THE COMMON INDIAN SAND-GROUSE

female	<i>Pteroclorus senegalensis erlangeri</i>	male
		life size

PTEROCLURUS SENEGALENSIS ERLANGERI.

THE COMMON INDIAN SAND-GROUSE.

Pterocles senegalensis, Licht. Verz. Doubl. p. 64 (1823) (Senegambia).

Pteroclorus exustus erlangeri, Neum. Orn. Monatsber. 1909, p. 154, Lahadj, S. Arabia; Hartert, Vog. Pal. p. 1511 (1920).

Pterocles exustus, Temm. Pl. Col. v, Nos. 354 and 360 (1825); Blyth, Cat. B. A. S. p. 249; Gould, B. of Asia, vi; Jerdon, B. of Ind. iii, p. 502; Blanford, Geol. and Faun. Abyss. p. 419; id. J. A. S. B. xxxviii, pt. ii, p. 189; McMaster, *ibid.* xl, pt. ii, p. 214; Stoliczka, *ibid.* xli, pt. ii, p. 249; Hume, S. F. i, p. 225; Adam, *ibid.* p. 392; Hume, Nests and Eggs, p. 513; King, S. F. ii, p. 458; Butler, *ibid.* iv, p. 4; Fairbank, *ibid.* p. 262; Hume & Marsh. Game-B. i, p. 69; Hume, S. F. vii, p. 161; Ball, *ibid.* p. 225; Doig, *ibid.* viii, p. 371; McInroy, *ibid.* p. 492; Hume, Cat. No. 802; Butler, Cat. B. of Sind, p. 53; id. Cat. B. S. Bom. p. 67; id. S. F. ix, p. 421; Reid, *ibid.* x, p. 61; Davidson, *ibid.* p. 316; Barnes, B. of Bom. p. 300; id. J. B. N. H. S. i, p. 55; id. *ibid.* v, p. 336; Hume's Nests and Eggs, 2nd Edit., p. 361; Newnham, J. B. N. H. S. vi, p. 94; Nurse, *ibid.* xiv, p. 172.

Pteroclorus exustus, Ball, S. F. ii, p. 426; Ogilvie-Grant, Cat. B. M. xxii, p. 12; Oates, Game-B. i, p. 26; Blanford, Avifauna B. I. iv, p. 60; Ogilvie-Grant, Game-B. i, p. 12; Le Mess. Game-B. 4th Edit. p. 58; E. C. Jukes, J. B. N. H. S. xix, p. 216; Whitehead, *ibid.* xx, p. 968; Moss-King, *ibid.* xxi, p. 100; Whitehead, *ibid.* xxii, p. 162; Stuart Baker, *ibid.* xxiii, p. 11; Beadon, *ibid.* xxiv, p. 192.

Pteroclidurus exustus, Sharpe, Hand-L. i, p. 50; Oates, Cat. Eggs B. M. i, p. 77.

Vernacular Names. Bhat-titur, Bakht-titur, Kumar-tit, Kakar, Dangar, Rowrie, H.; Butabur, Batibun, Sind; Popandi, Bhil; Pakorade, Mahr; Jam polanka, Tel.; Kal-Gorjal-Haki, Canarese, Mysore; Kal-handari, Tamil.

Description. **Adult Male.**—Crown to rump and upper tail-coverts isabelline-grey to isabelline-brown, generally darkest on the tail-coverts and palest on the crown; lores, cheeks, chin and throat dull yellow-ochre, often tinged with orange-buff, this colour extending round to the back of the nape, forming an indistinct collar which shades off into the other parts. Scapulars and sometimes the feathers

of the interscapular region the same as the rest of the back, but darker and changing into ochreous-buff or buff at the ends, which are margined with brown at the tips. Inner lesser coverts like the back, gradually changing to buff, or ochreous, on the other lesser, median and inner greater coverts which are margined with brown; greater secondary-coverts and inner secondaries buff, or ochreous-buff, the latter shaded with olive on the inner web and inside of the outer web. Edge of shoulder of wing, bastard-wing, primary-coverts and primaries dark-brown, the five inner primaries with broad oblique bands of white at the end; outer secondaries brown.

The yellow-ochre of the throat and fore-neck changes into vinous-buff on the upper breast, which is divided from the lower breast by a narrow band of black, above which is an indefinite and still more narrow band of white, caused by the white of the black-tipped feathers showing through; lower breast dull yellow-buff changing gradually into the chocolate of the rest of the lower plumage and flanks, which itself becomes black in the centre of the abdomen; feathers of the tarsus and under tail-coverts creamy-buff; central tail-feathers like the back, darkening towards the narrow prolonged portions, which are quite black at the ends; the other rectrices are tipped with pale-buff and the outermost also mottled with dark-rufous next this pale tip.

On the upper plumage the colour shows most variation on the wings, where it runs from a beautiful pale vinous-buff or cream dove-colour to a bright chrome-yellow. In the great majority of birds the general tone is a vinaceous-buff, with sandy-yellow predominating on the softer feathers of the wing.

The amount of black on the abdomen also differs greatly in different individuals, but African birds, on an average, seem darker and more richly-coloured here than are Indian specimens.

The yellow of the throat varies from pale, rather dull chrome-yellow, to a bright almost deep-chrome.

Measurements.—“In this species the males average rather larger and heavier and have decidedly longer tails. The following is a resumé of many measurements recorded in the flesh:—

Males.—“Length 11·75 to 13·75; expanse 21·13 to 22·5; wing 6·7 to 7·5; tail from vent 4·38 to 5·87; tarsus 0·9 to 1·0; bill from gape ·62 to ·7. Weight 8 to nearly 10 ozs.” (*Hume.*)

To the above I may add a few average measurements taken from the *made up skins* of over 100 specimens. Wing 7.15 inches (= 181.6 mm.), bill at front, from tip to feathers on forehead .52 (= 13.6 mm.).

Colours of Soft Parts.—“The feet and bill vary from pale slaty-grey to pale-plumbeous, or lavender-blue; the irides are dark-brown and the orbital skin pale lemon-yellow to pale yellowish-green.” (*Hume.*)

Adult Female.—Whole of upper plumage rather dull buff, sometimes sandy-buff, sometimes vinaceous and sometimes with here and there a slightly rufescent tinge; the feathers of the crown and nape are marked with central longitudinal spots of dark-brown which form regular streaks, on the hind-neck the spots widen into blotches and on the upper back become broad bars, the centre wider and pointed; the feathers of the rest of the upper parts are barred; scapulars, innermost secondaries and lesser and median coverts like the back, but the feathers broadly tipped with buff and some of the coverts very finely edged with reddish-brown; remainder of wing like the male, but with fewer reddish bars on the median coverts. Chin, lores, supercilia, sides of the head and throat yellow-ochre, the sides of the head speckled with blackish-brown, these spots increasing in size on the neck and breast, which are like the back, but generally with a stronger vinaceous tint; the chin and throat are immaculate in old birds, but the ear-coverts have fine black hair-marks. Most females have a faint indication of a very dark brown line separating the upper breast from the lower, which is a dull pale ochre-buff; abdomen, flanks and feathers of vent rufous-buff closely barred with very dark brown, under tail-coverts creamy-buff. Tail-feathers like those of the male; axillaries and under aspect of wing brown, the smaller coverts and shoulders barred with dull-buff.

As already shown above, the birds grade in general tone from a sandy-buff to a dull vinaceous-buff above and on the under plumage they vary to much the same extent. The upper breast in some specimens may be quite a dull, almost brown tint, whilst in other birds it may be quite a pale sandy-buff; most birds will, however, be found intermediate. The light unspotted lower breast also varies in

some degree, though not as much, I think, as the upper breast, and the abdomen and flanks also go through the same gradations of colours; western birds appear to be invariably darker than our Indian birds on these parts, although they seem no more richly coloured above. The colour of the throat and chin varies from very pale cream-yellow to quite a rich, though light, chrome-yellow.

Measurements. Females.—“Length 11 to 12·25, expanse 20·9 to 21·5, wing 6·6 to 6·9, tail from vent 4·0 to 4·8, tarsus ‘8 to ‘85, bill from gape ‘6 to ‘67. Weight 7·5 to 8·3 ozs.” (*Hume.*)

The average wing-measurement of about 100 females in the British Museum is 6·85 inches (= 173·9 mm.). The extremes of length, however, are far greater than in Hume’s series, ranging from 6·35 to 7·05 (= 161·2 to 178·0 mm.).

The colours of the soft parts are the same as in the male.

“An immature female differs from the adult in having the outer primaries and inner secondaries tipped with buff, the former vermiculated with black, the upper breast spotted with blackish-brown, the centre pair of tail feathers not produced with filaments.” (*Ogilvie-Grant.*)

A young bird with points of fluff still about it, has the whole of the upper parts a pale dull buff and is finely vermiculated all over with tiny wavy bars of black, many of the feathers having the ends edged with white and with a chestnut patch at the tip. From chin to breast the colour is an earthy-buff with fine bars of blackish and the abdomen and flanks are dull black. The quills are blackish-brown, the tips freckled with buff and black, and the inner secondaries freckled thus all over; the greater and median primary-coverts are also black, the former very narrowly, the latter broadly edged with dark-buff.

Another specimen older than the last and with all the nestling-fluff worn off is the same, but has a wide band below the breast and above the black abdomen almost devoid of spots, and the breast instead of being vermiculated with narrow black bars has definite black spots; the inner secondaries are also more clearly and regularly barred with dull buff and deep brown, though the tips retain the same chestnut and black freckling. The tail is throughout banded earthy-buff and black.

Nestling in Down.—This is yet another of our common Indian Game-Birds, the nestling of which still remains to be described.

Distribution.—The Common Indian Sand-Grouse is found outside India only in Beluchistan, South Persia, Arabia Petrea, the extreme south of Arabia and South and South-west Palestine, being replaced by allied subspecies in Africa.

Within India it occurs practically over the whole continent in suitable places and Hume thus defines its habitat:—

“Throughout India proper, where the rainfall is moderate, the soil fairly dry and the country open and tolerably level, the Common Sand-Grouse abounds. Towards the east and south its general distribution is much that of the Painted Sand-Grouse, though the particular localities it affects are different; but it is a western form which extends into India and not a purely Indian form, and it is common in places (for instance in Sind) to which *P. fasciatus* does not extend.

“It is a bird of the level, sparsely wooded, sandy countries, *par excellence*, and though it may be shot in sundry plains *close* to hills in Rajputana, unlike the Painted Sand-Grouse, it eschews hills, has no liking for scrub, and absolutely avoids damp, swampy, low-lying tracts, jungles and forests.

“Bearing this in mind, it may be said that it occurs in all suitable localities through the Punjab, Sind, Rajputana, the North-west Provinces and Oudh, the western parts of Behar and Chota Nagpore, the Central Provinces and the Central India Agency, including Bundelkhand, Berar, the Nizam's Territory, the whole Bombay Presidency, except the Sub-Ghat littoral, Mysore and the Northern and Central portions of the Madras Presidency.”

Blanford records that he has seen this sand-grouse at Ranee-gange and I have seen it in the same district of Birbhum. Dr. King saw one in the Botanical Gardens, Calcutta (probably an escaped bird), and Blanford, again, shot some a little to the north of the Cauvery, near Trichinopoly. It does not extend to Ceylon, but it is found in Travancore, whence I have received eggs.

Colonel Faithful, in *epistolá*, says, “about three or four years ago I came across a flock of about six of the small kind of sand-grouse on the Karewa at the back of Ardwin in the Phupiyan direction; these and the one I shot are the only ones I have ever seen in Kashmir. The one I shot was got in the early part of February.”

Nidification.—The Common Sand-Grouse breeds everywhere within its range in India, more freely in some parts than in others, according to whether the wide stretches of waste lands it loves and requires are obtainable or not.

What constitutes the breeding-season of the Common Sand-Grouse is, it must be admitted, practically impossible to determine, and the utmost one can say is that more breed in some months than in others and even thus we must hedge and allow that what are the favourite months in one place need not be so in another place no great distance away. For instance, if we take the three places Sirsa, Hissar, and Hansi, all close together in the south of the Punjab, we find that the British Museum has a series of no less than seventy-five eggs from round about these towns which were taken in the following months :—

March	...	...	...	9
April	...	...	...	23
May	...	...	...	6
June	...	...	...	5
July	...	...	...	9
August	...	...	...	0
September	...	...	...	8

and thirty-five are not dated. This does not help us much, but would seem to imply that they do not lay in the cold weather. If we then turn to Hume's 'Nests and Eggs' we find Khan Nizam-oo-deen, Khan Bahadur, took eggs at or near Sirsa on the following dates :—

1869				1870
January				—
February	...	...	...	3rd, 24th
March	...	...	...	1st, 4th, 12th, 21st
April	...	...	...	21st, 22nd, 27th, 28th
May 8th and 25th	...	...	...	1st, 3rd, 5th, 7th, 15th, 28th
June 16th, 17th, 30th	...	...	...	11th, 15th, 21st, 30th
July 1st, 2nd, 5th, 10th, 11th, 12th				23rd
August				—
September 1st, 2nd, 3rd, 7th, 10th				—
October	...	...	...	3rd, 22nd
November	...	...	...	24th
December	...	...	...	7th, 20th

Here we have eggs in every month but January and August, but the favourite months may be said to be March to July. In confirmation of this, Mr. R. M. Adam says that about the Sambhar Lake they breed in great numbers in April and May. Mr. J. Davidson took these eggs from January to June in the Deccan, and Major Cock found them breeding at Nowshera in May and June, whilst Mr. A. Anderson says that in the Doab they breed in March, April and May, and finally Colonel Butler found their eggs at Dunganwar (fifty-five miles south of Deesa) in March and May. On the other hand Davidson found them breeding in Western Khandesh in February, in the same month Colonel Butler found their eggs in Belgaum, and Mr. Hastings took their eggs in October in Etawah, South-west United Provinces.

Colonel Bingham wrote to me that he took their eggs near Mhow in January, and Mr. E. G. Pythian-Adams also wrote to me to the effect that he found them laying round about Poona in December, January and February, and I have also eggs taken by Vidal (Aligur) and by Bulkley (Sind) in the former month.

The only conclusion one can draw is that these birds breed more or less throughout the year, but that in North and Central India more breed from March to July than in other months, whilst further south they breed earlier, the majority in February and March. It is probable also that most birds lay twice in the year at least.

The eggs are laid in a depression in the soil, either natural or scratched out by the birds themselves. In the very great majority of cases there is no lining of any sort whatsoever, but Adams, Anderson and one or two other observers have found a certain amount of grass placed in the hollow as a sort of rough lining. How rare, however, it is to find such, is shown by the fact that in the enormous number of nesting-places found by Hume, Davidson and the Khan Bahadur, never once did any of them ever find any lining placed in the depression below the eggs.

Three is the number of eggs almost invariably laid, but occasionally two only are incubated. The stories however, of five and four eggs being laid by the same bird are almost certainly the result of two birds laying in the same nest-hole or of some mistake on the part of the collector. Both sexes take part in incubation, and as

the eggs are laid in great open plains, generally with no scrub, grass or stone to shield them from the sun, the birds have to cover the eggs in the heat of the day to prevent them being killed, if not cooked, by the sun. Now and then the bird may take advantage of the cover afforded by a tuft of grass or small bush, or she may lay her eggs in amongst stones which partially shield them from the sun, but she never makes her nest-hole in among bushes and jungle as does the Painted Sand-Grouse. Hume says the haunts it loves best as breeding-sites are scattered stubble or fallow, or newly-ploughed fields rather than the large semi-desert plains surrounding them.

Mr. A. Anderson found them breeding in a curious place "a plain covered for miles with *reh* (a saline effervescence) which gave the ground the appearance of being carpeted with thick snow." On this ground he flushed a Sand-Grouse from a pair of eggs and he goes on to note "my camp being close to this place, I amused myself in watching the birds incubating, feeding round about their nest and dusting themselves after the fashion of fowls. On the 4th as I approached the nest, the bird glided off, and skulked away in a crouching position so as to avoid detection, and then squatted."

An extraordinary instance of the closeness with which this bird will sometimes sit is given by Mr. Beadon, who succeeded in taking photos of a sitting hen from a distance of eight feet.

Incubation appears in India to extend over eighteen or nineteen days, but may vary more than this according to the time of year in which the eggs are laid. Mr. Meade-Waldo, who has been successful in rearing these birds in captivity, reports ('Avicultural Magazine,' March, 1913), that eggs laid in April were not hatched until the twenty-third day, whereas others laid in July were hatched in eighteen to nineteen days.

In this article Mr. Meade-Waldo writes: "The procedure of these birds is precisely the same as the Greater Pintailed Sand-Grouse (*Pteroclorus alchata*), viz., the female incubates by day, the male by night, and the male soaks his breast with water for the young to drink or rather suck."

As regards the eggs I have but a poor series and can add

nothing to what Hume has recorded in 'Game-Birds.' Here he describes them as follows :—

"The eggs, like those of all other Sand-Grouse, are long and cylindrical, like those of a Night Jar. The texture is fine and smooth, and they have generally a fine gloss. Not only in shape, but in marking also, do many of them strongly resemble those of some species of Night Jar. The ground colour varies much; in some it is pale, somewhat pinkish stone colour, in others greyish or dingy or greenish white; in some pale *cafe-au-lait*, in others a somewhat light olive-brown. Typically they are thickly spotted, streaked or irregularly blotched pretty uniformly over the whole surface, with two sets of markings, the one of darker or lighter shades of olive brown, the other a sort of pale inky purple, and these latter, which are most commonly streaks and clouds, seem to underlie the others. Different eggs vary much in the distribution, size and intensity of these markings, as also in the relative proportion of the extent of surface covered respectively with what I may call the primary and secondary markings: in some almost the whole ground colour not occupied by the primary markings is clouded with the pale inky purple, in others only here and there a few spots of this colour are traceable; in some all the markings are small, very thickly set and freckled, in others they are bold, large, eccentrically shaped blotches, comparatively thinly distributed over the surface. Some of the eggs are, as a whole, very much darker coloured than others, and in some the ground colour might perhaps be best described as a faintly greenish grey. As a rule the paler the ground, the paler the markings, and *vice versa*. Exceptionally beautiful marbled eggs are met with, as also unmottled pale creamy varieties.

"I have never, however, seen one that could be taken for an egg of *fasciatus*.

"The eggs vary in length from 1.32 to 1.6 inches and in breadth from 0.93 to 1.11; but the average of seventy eggs is 1.45 by 1.03."

Reducing Hume's figures to millimetres, we get respectively 33.6 to 40.5, 23.2 to 28.2 and 36.8 by 26.2.

Oates gave the measurements in breadth of the eggs in the British Museum as running up to 1.15 inches (= 29.2 mm. and the average of 129 eggs in that Museum, added to 102 other eggs of which I have obtained the measurements, is exactly the same as that given by Hume.

It is not possible ever to confound these eggs with those of the Painted Sand-Grouse (*P. indicus*) for these latter are always salmon, bright-buff or pink in general tone, whereas those of the Common

Indian Sand-Grouse (*P. senegalensis*) are always greyish or olive-grey in tint when looked at as a whole.

General Habits.—Jerdon gives a most interesting account of this sand-grouse and its habits. He remarks :—

“ This is the most common and abundant species of Sand-Grouse throughout India, being found in every part of the country, except the more wooded portions, and never occurring in forest districts.

“ This Sand-Grouse frequents the bare open plains, whether rocky or otherwise, and is very partial to ploughed lands and bare fallow fields. It feeds chiefly in the morning and between eight and nine a.m., goes to drink at some river or tank, at which, in some parts of the country, thousands assemble, and they may be seen winging their way in larger or smaller parties from all quarters, at a great height, uttering their peculiar loud piercing call, which announces their vicinity to the sportsman long before he has seen them. They remain a few minutes at the water's edge, walking about and picking up fragments of sand or gravel, and then fly off as they came. In the hot weather at all events, if not at all seasons, they drink again about four p.m. When they are seated on bare sandy or rocky ground, they are most difficult to observe, from the similarity of their colour to the ground; sometimes they can be approached with care near enough to get a good shot, at other times, especially if in large flocks, they are shy and wary. A small flock or single bird can often be approached very close by walking rapidly, not straight, but gradually edging towards them; and, in this way. I have often walked up to within two or three yards of them. They feed on various hard seeds, especially on those of various *Alysicarpi desmodium*, etc., as well as on grass, seeds and grain.

“ The bird, if kept long enough, is very excellent eating, though the flesh is somewhat hard and tough, but with a high game flavour; and the young birds when nearly full grown are excellent.”

This species of sand-grouse, in India, is not migratory, though it may move about to some slight extent under pressure of climatic conditions, and during the height of the extreme dry season may wander into districts it does not visit at other times.

Its drinking-hour depends on the season, and it often does not drink in the cold weather until nearly 10 o'clock, whereas in May and June it will be found watering as early as 7 a.m. Roughly speaking, it appears to feed for some two hours after the sun is up, after which it drinks before settling down for a siesta during the

hotter hours of the day. In the evening it often does not drink at all, but during the hot weather thirst generally compels it to drink again before its evening feeding-hour, and it will then be found at water between 3.30 and 4.30 or a little later. It is not crepuscular in its habits like *Pterocles indicus* and *coronatus*.

Its food appears to be entirely vegetarian, and even as such confined mainly to hard seeds and grain; in two instances only did Hume find insects in its stomach and I can find no other records referring to this diet. They do sometimes resort to cultivated fields for grain and seed, but for the greater part they keep to the uncultivated plains, and it is wonderful how they manage, not only to obtain enough food to sustain their great vitality, but actually to keep them plump and in the highest condition.

They are not as a rule found in enormous flocks such as those of *Pteroclorus alchatus* and *Pterocles orientalis*, and flocks of over 100 are exceptional, though some few of 200 or even more have been seen. Generally the flocks number twenty or thirty to fifty and these come down to water in independent packs, not collecting together for the purpose. Arrived, they settle at once, unless alarmed, a short distance from the water and there, like all sand-grouse, squat for a few seconds or minutes before running down to the water's edge for their drink. After this they remain a short time and walk about and scatter a good deal, but do not seem to quarrel with one another as do so many other sand-grouse, and then all fly off again to their resting-place.

Hume says that in the day-time when feeding they scatter widely over the ground, but that during the night when sleeping they collect in a very compact mass; he also adds:—

“ And during the night they must keep better watch than during the day, for often when crossing the huge Oosur plains in Etawah after dark, at times after midnight, I have heard flocks of them rise at considerable distance from me. Moreover, I have never found any of their feathers about in the morning, as I have of so many ground roosting birds, showing where a jackal or a fox has made a lucky hit. If one remembers how abundant this species is in many districts and how superabundant in the same places are foxes, jackals and wild cats, and also that the Sand-Grouse leaves a strong scent by which a dog will nose out a wounded bird hidden amongst the clods of a

ploughed field in a moment, it does speak well for *their chowkidars* that none of these little Sand-Grouse ever seem to fall victims to these midnight marauders.

"Still native fowlers will at times surprise them, and during dark nights, in some fashion, creep up and drop a net over the entire party. The net used is a very light one, a truncated triangle about 8 feet wide at bottom, 4 feet at top, and about 4 feet wide, attached to two light slender bamboos, each about 8 feet long. The covey is marked as it goes to roost, and then the man about 11 o'clock (the night must be dark, and is all the better for being windy) steals up and drops the net over the whole pack. I went out several nights to try and be present at a capture, but on only one occasion were any caught, and then only two, but a few nights after, the men, who were *akerias*, and who were still in my camp, snaring ducks and quails, brought in some forty, that they professed to have caught in this way in one haul, and they were polite enough to hint that it was the bad smell of a European that had foiled their efforts on previous occasions. They were doubtless humbugging in some way, but one thing is certain, they do constantly manage to catch whole packs in some way or other during dark nights, and are therefore, though they certainly do not *look* so, considerably sharper than the beasts of the field."

The only way of making a big bag of Sand-Grouse is to wait for them at their drinking-place, but in this way very big bags indeed can be made, especially when arrangements are made to prevent the birds watering at any other pieces of water within a radius of some miles, as is done sometimes when "big wigs" have to be provided with sport.

During the non-breeding season shooting over water is legitimate enough, for the Common Sand-Grouse are strong and good fliers, fly high, and take a lot of hitting before they drop. They must, however, be given a rest during the principal breeding-season, if this can be defined, and, where it cannot, then the normal season must be allowed them, and the birds forced to adapt themselves to it.

When thirsty they must drink, and it takes a lot of shooting to drive them away even temporarily, but Hume mentions a case in the Sirsa district in which the cruel sport was practised by two guns down at the water's edge and a great number killed, and during the next week a large number of eggs were found deserted and destroyed (I suppose by crows and mongooses) in what was known to be a favourite breeding-place, two or three miles from the tank.

From the above it is plain that these birds can be driven right out of a district by too much persecution at their drinking-places, a fact which should be carefully borne in mind by sportsmen.

Fortunately this sand-grouse does not seem to be decreasing in India; bags are made as big now as were made fifty years ago, and the flocks seem to be as big and as numerous as ever they were in Hume's time. It is not so long ago that Major Nurse wrote as follows: "The Common Sand-Grouse (*Pterocles exustus*) has been unusually abundant at Deesa this year. I feel sure they must have increased in numbers since I first came here, now nearly five years ago. Possibly the last few years, which have been unusually dry, have been especially favourable to their increase. A few weeks ago over 400 were shot over a running stream one morning by a party of seven or eight guns, and this at a place where more than 200 birds had been killed on several previous occasions during the course of a few weeks."

Here and there a sportsman writes to say that he thinks the birds have decreased in numbers, but where this is the case the decrease is generally found to correspond with an increase in cultivation or irrigation, and where their haunts have been left untouched there the birds seem to be much as they were in Hume's time.

The Common Sand-Grouse is an easy bird to domesticate and is often kept by natives and has also been successfully kept by Europeans. Mr. C. Barnby Smith, in the August, 1910, number of the 'Avicultural Magazine' has the following interesting notes on this bird in captivity:—

"A friend very kindly sent me over three Indian Painted Sand-Grouse (*Pterocles fasciatus*) caught near Bhopal in Central India. The birds (a cock and two hens) arrived in good health in the early part of last February. At the same time a consignment of the Common Pintailed Sand-Grouse (*Pterocles exustus*) arrived. These birds seem to travel well, as out of eighteen birds that left Calcutta sixteen arrived alive.

"Such of the Pintailed Sand-Grouse as I retained for myself I put at first with the Painted Sand-Grouse in the conventional sort of place—a large wooden shed (with sand floor) open on the south, on which side it has a sort of glass verandah with grass on the ground underneath.

"The birds were, and are, fed on millet, canary, maw, rape and hemp seeds, but seem to like millet best of all. They are also supplied with lime, small flint, grit and rock salt.

"The Pintailed Sand-Grouse do not seem to care for grass at all but love to squat in the sand, basking in the sun whenever possible. The greatest danger with these birds seems to be their sudden panics, which make them dash violently against the sides of the enclosures unless the feathers of one wing are heavily cut. My birds arrived late at night (as birds always seem to do) and when I went to look at them the following morning the whole lot were dashing with wild flights and shrieks of terror in all directions. It was only prompt and resolute action with a landing net and subsequently with a pair of scissors that put a stop to their apparently determined efforts at suicide.

"The Pintailed Sand-Grouse soon become comparatively tame and run about on the sand with contented little 'crooning' cries. I have noticed that they are much steadier when divided as, when a lot are together, the alarm note of one at once sets off the others attempting to fly. So far I have seen no signs of nesting, though I have divided them into several different enclosures in hopes they will do so."



THE SPOTTED SAND-GROUSE.

male.	<i>Pteroclorus senegallus</i>	female
	lin. str.	

PTEROCLURUS SENEGALLUS.

THE SPOTTED SAND-GROUSE.

Tetrao senegallus, Linn. *Mantissa*, p. 526 (1867-71) (Senegal).

Pterocles senegallus, Shelley, *B. of Egypt*, p. 220 (1872); Jerdon, *B. of I.* iii, p. 504; Hume, *S. F.* i, p. 221; *id. ibid.* xi, p. 331; *id. ibid.* iv, p. 4; Butler, *ibid.* iv; *id. ibid.* p. 508; Blanford, *E. Persia*, ii, p. 271; Hume, *S. F.* v, p. 60; Butler, *ibid.* p. 222; Hume, *ibid.* vii, p. 161; Hume, *Cat. No.* 801; Butler, *Cat. B. of Sind*, p. 53; Hume & Marsh. *Game-B.* i, p. 53; Doig, *S. F.* viii, p. 371; Tufnell, *ibid.* ix, p. 200; Barnes, *B. of Bom.* p. 297; Hume's *Nests and Eggs*, iii, p. 366; Bulkley, *J. B. N. H. S.* xiii, p. 704; Nicol. Cumming, *ibid.* xvi, p. 641; Tomlinson, *ibid.* xxiv, p. 828 (1916); Jourdain, *Bull. B. O. C.* xxxix, p. 27 (1919); Hartert, *Vog. Pal.* p. 1507 (1920).

Pterocles senegalensis, Blyth, *J. A. S. B.* xxiv, p. 303.

Pterocles guttatus, Licht. *Verz. Doubl.* p. 64.

Pteroclorus senegallus, Ogilvie-Grant, *Cat. B. M.* xxii, p. 14; Blanford, *Avifauna B. I.* iv, p. 61; Ogilvie-Grant, *Game-B.* i, p. 14; Oates, *Game-B.* i, p. 31; Stuart Baker, *J. B. N. H. S.* xxiii, p. 183.

Pteroclidurus senegallus, Sharpe, *Hand-L.* i, p. 50.

Vernacular Names. *Nango Katingo, Gutu, Sind.*

Description. Adult Male.—Crown of head and whole upper plumage to tail a soft isabelline-grey or isabelline, the tail-coverts and sometimes the rump suffused with bright chrome-buff; edge of the forehead, lores and round the eye grey, produced backwards as far as the nape, where it forms a collar, and on the neck and upper breast below the yellow-ochre chin, throat and ear-coverts and sides of the neck; the grey on the breast runs up to the throat in a point and next to the back and breast merges into the colour of those parts; scapulars pale isabelline-brown at the base changing to a grey penultimate band with buff or ochre tips; wing-coverts dull isabelline-brown with buff tips, the innermost next the back all buff where visible; shoulder of wing, greater, median and primary-coverts isabelline-buff with brown shafts and suffused with brown at the tips; primaries the same and with all but the first three tipped and edged on the inner web with buff, this colour increasing in

width towards the innermost primary; secondaries brown, narrowly edged with buff on the outer webs at the ends and gradually changing in colouration until the innermost are like the scapulars, but always with yellow-ochre, or chrome-yellow, not buff tip; below the grey of the lower throat and breast gradually changes on the breast to a beautiful isabelline, purer and more pink than on the back, and covering breast, flanks and abdomen, except the centre of the latter, which is black; under tail-coverts white or pale-buff with brown bases showing through; axillaries very pale buff, lesser under wing-coverts buff, primary-coverts brown; central tail-feathers like the back, but produced into two long "pins" or filaments, which are dusky-black; outer tail-feathers brown with broad white tips, each succeeding pair having broader tips than the last; feathers of tarsus buff.

The range of variation in the colouration of this bird is not great; the upper parts are always isabelline, sometimes rather darker, sometimes rather lighter; rarely there is a vinaceous tinge in the back and scapulary region, and more rarely still there is a faint rufous tinge here; the scapulars themselves may be tipped buff or chrome-yellow, and the extent and richness of these spots is the most variable feature in the upper plumage. In a few birds the crown is rather richer and more vinous than the rest of the upper parts.

Below the general tone varies to the same extent as above, and the richness of the yellow on the throat is sometimes wanting, the chin being somewhat albescent and the rest very pale; the extent of black on the abdomen is generally about the same, but the colour is often more a chocolate-brown than a black, and a pure rich black is seldom seen.

Colours of Soft Parts.—"Irides brown; bare orbital skin yellowish; bill pale plumbeous bluish-grey or bluish-white, always somewhat more dusky towards the tip; feet pale-plumbeous or bluish-white, paler towards the upper surface of the toes, and whitish on scales." (*Hume.*)

"Bill bluish-grey, iris brown, upper eyelid saffron-yellow, feet dull bluish-grey with blackish claws." (*Pitman.*)

In some specimens the orbital skin has a tinge of green, though this is rare, and in some it is a pure pale lemon.

Measurements. "Males.—Length 13·4 to 14·7 inches, expanse 23 to 23·7, tail from vent 5·3 to 6·0, wing 7·5 to 7·9; the wings when closed reach to within 2·3 to 2·8 of the end of the longest tail-feathers, viz., the central ones, which exceed the others by from 1·75 to 2·0, bill at front ·44 to ·47, tarsus 1·0 to 1·05. Weight 9 to 12 ozs." (*Hume.*)

My measurements, which include those of all the skins in the British Museum, average a little larger than Hume's do. Wing 7·50 inches (= 190·5 mm.) to 8·20 (= 208·2 mm.) with an average of 7·84 (= 198·9 mm.), tarsus ·90 (= 22·8 mm.) to 1·0 (= 25·4 mm.) with an average of ·93 full (= 23·6 mm.) and bill at front ·45 (= 11·5 mm.) to ·50 (= 12·6 mm.) and averaging about ·48 or a little over (= 12·2 mm.). The tail is anything from 5·0 (= 127·0 mm.) to about 6·6 (= 167·6 mm.) or over. "Weight up to 12 ozs." (*Pitman.*)

Adult female.—Whole upper plumage, including wing-coverts, scapulars and innermost secondaries, isabelline of a darker, redder tint than in the male; the head is marked with fine central marks of black or dark-brown, which form streaks, the rest of the upper parts are boldly spotted with dark-brown or black, the spots being boldest and largest and often tinged with grey on the scapulars and innermost secondaries, which feathers also have broad marks of chrome-yellow at the tips on the outer webs. Lores white, and a faint mark of white round the eye and thence backwards takes the place of the grey in the male, but is finely marked with black and stops short of the nape. Remainder of under parts like the male, but paler and less pink or vinaceous, and with the central portion of the abdomen more decidedly brown. The wing-quills are the same as in the male, and the tail also is similarly coloured. On the upper plumage the colour ranges from sandy-isabelline to a rufous or vinous isabelline, extremes of either colour being decidedly rare. In many birds the yellow splashes on the scapulars are very faint, and in a few altogether absent. In a good many birds the buff below is almost white and is seldom at all rich; the yellow throat also is often very pale and the amount of spotting on the throat and breast is by no means constant, being very sparse on the lower breast in some specimens.

The colours of the soft parts are the same as in the male.

Measurements. Females.—“Length 12·4 to 13·1 inches; expanse 22·0 to 22·6; tail from vent 4 to 4·6; the central tail-feathers only extending from 0·75 to 1·2 beyond the rest; wing 7·3 to 7·5; bill at front 0·4 to 0·44. Weight 8 to 9 ozs.” (*Hume.*)

Wing 6·96 inches (= 176·7 mm.) to 7·75 (= 196·7 mm.) with an average of 7·35 (= 186·5 mm.).

From the above it will be seen that I make the difference between the male and female rather greater than Hume does as regards wing-measurements. The tarsus and bill average respectively ·90 inches (= 22·8 mm.), and ·43 (= 10·8 mm.).

So far we have no description either of the young bird or of the nestling.

Distribution.—The Spotted Sand-Grouse, *Pteroclorus senegallus*, extends from Algeria, where, Whitaker says it is very common, throughout the whole of Northern Africa, parts of the Sahara, North and South Nubia and Egypt, and thence through Arabia, Palestine, Mesopotamia, Persia, Afghanistan, Beluchistan, and into North-west India.

It has also been killed on one occasion in Europe, Mr. J. O. S. Whitaker having obtained a single specimen at Syracuse on the 28th April, 1910.

Within our limits Blanford thus defines its habitat:—“Common in Sind west of the Indus, rare to the eastward, but recorded from the neighbourhood of the Runn of Cutch, including Kathiawar, and from Jamboghora, west of Ahmedabad; also from Poharan between Jeysulmere and Jodhpore, and from Shapur district in the Punjab. Mhow is given as a locality in the British Museum Catalogue for a specimen received from Colonel Swinhoe, but in error, for the specimen thus marked is really from Pirchoki, below the Bolan Pass.” As regards Kathiawar, Colonel L. L. Fenton tells me that he has only seen a very few of these birds, and that only in the cold weather in the north-east of the Province. He has met with them north of the Tabli Road station in the Wadhwan-Ahmedabad railway, though they were not common. Harrington Bulkley, writing to the Journal of the Bombay Natural History Society from Kharaghora, says that “they are found in numbers all along the Runn, 100 miles north of this.”

Mr. Percy Hyde *in epistolâ* also records that "in January, 1902, there were three or four packs of the Spotted Sand-Grouse about eighteen miles east of Karachi.

To the west there appear to be no records beyond those of Blanford except a single bird reported to me as shot near Nagar in Jodhpore.

The greater number of the birds which visit India appear to be migrants from across the border during the cold weather, but there is no doubt that a considerable number remain all the year round. Bulkley in commenting on Barnes' note to the effect that "a few apparently remain to breed in Sind," writes, "a fair number of them remain throughout the year, as I have seen them in the hot weather and in the monsoon in Guzerat."

In the Trans-Indus country, Sind, and the Punjab these Sand-Grouse are very numerous in the cold weather and a considerable number are also found in between the Indus and the Jhelum and Chenab. Further south they are numerous in Cutch and Guzerat and in the west of the desert country of Jusalmir and Mallani. East of this they are only found as stragglers in the winter months.

Nidification.—The Spotted Sand-Grouse probably breeds in some numbers in Sind, but owing to the great difficulties in getting to, and working, the arid wastes in which they breed, there is very little on record concerning them.

Mr. Pearson took two sets of three eggs at Kotri on May 16th and other, oviduct, eggs have been obtained, and Dr. C. B. Ticehurst in a letter to me writes: "Yes, certainly *senegallus* breeds in Sind, but not near here (Karachi); some breed very early, as I shot a female on the 18th February, which had just passed an egg."

They breed in many parts of Mesopotamia and South Persia. Tomlinson has taken several clutches near Basra, and Pitman found them breeding near Kut-el-Almara, Sinn, etc.

The breeding-season must be a very protracted one, as one of my eggs, taken from the oviduct, was procured in February in Sind, whilst those taken by Mr. H. Pearson in the same country were laid in May, and yet another oviduct-egg in my collection was not procured until August. The clutch of eggs taken by Dodson in Tripoli were found in July. Jourdain obtained a pair of eggs (one

was smashed) in Algeria on the 15th May and finally, Tomlinson took eggs near Basra in June, and Pitman and others near Kut in the same month. It seems possible, therefore, that like the Common Indian Sand-Grouse, the eggs may be found in practically any month of the year, *provided* one knows where to look for them.

Captain Pitman informs me that :—

“ They are fairly common and breed round Kut and Sinn, though I was not lucky enough to find any clutch of eggs I could keep and clean. The birds seem to prefer the same bare ground for breeding purposes as that normally frequented by them at other seasons, and which is well away from human habitation. At the end of June I found a clutch of three eggs laid on the ground; there was no sign of any nest, and the eggs were placed on the bare hard ‘ pat ’ (dried mud) of a dried up marsh. Unfortunately the eggs were on the point of hatching and it was quite impossible for me to clean them.

“ They were slightly smaller than those of the Large Pintailed Sand-Grouse, though much the same in shape, *i.e.*, elongated ovals. In colour they were a greenish-stone with brownish and reddish spots and blotches, thicker at one end than the other, but nowhere very bold or pronounced, and not very distinguishable from the ground colour.”

Jourdain describes the nest as “ a mere scratching in sandy ground in the southern part of the great plain of El Ontaya. Here the plain is practically flat, and the surface consists, not of loose sand, but of hard sandy soil, more or less broken up by small stones. Here and there is a little vegetation, for the most part small clumps of thyme (?) and other plants, but the eggs are laid in a hollow well away from any protection of this kind. This Grouse was rare here, but far more common further south, about thirty kilometres south-east of Biskra, where small flocks were constantly seen.”

Eggs have also been laid by captive birds in the Giza Zoological Gardens. Dr. Hartert obtained an oviduct-egg in Algeria on the 22nd April, and Aharoni took a single egg in Mesopotamia on the 15th May, 1911, which is now in the Tring Museum.

The eggs are, of course, the usual cylindrical or elliptical shape common to all sand-grouse, and the texture is also, as usual, fine and smooth, though there is very little gloss in the majority, and in no case is it as highly developed as it is in the eggs of many other species.

In colour the eggs vary from a pale stone-buff or creamy-café-au-lait to a somewhat greenish stone-colour, in all cases, however, of a rather dull tint. They are marked all over with blotches, spots and specks of pale, rather reddish, brown, and a few smaller spots and specks of very dark amber-brown, in one or two cases almost black. The paler markings are very irregular in shape, here and there becoming broad, irregular lines rather than blotches, and in others looking more like accidental smears than anything else. The secondary markings are of pale-brown, very washed-out and ill-defined, and pale lavender-grey or neutral tint.

The twenty-four eggs of which I have been able to obtain measurements average 40.16×28.2 mm. The maxima are 48.5×28.0 mm., and 40.0×30.0 mm. The minima are 38.1×26.6 mm.

Two eggs taken by Harrington Bulkley from the oviducts of females shot by a Mr. Fletcher are now in my collection and are included in the above averages, etc., but in colour both these are pure white with a very fine close texture and quite unusually high gloss.

General Habits.—Captain C. R. S. Pitman sends me the following interesting notes on this sand-grouse from Kut-el-Amara in Mesopotamia :—

“This bird is very common in many parts of Mesopotamia but is very unequally distributed and also varies greatly in numbers from time to time in the same place. Its call may be syllabized as ‘wey-heu wey-heu’ or ‘whit-hu whit-hu,’ or sometimes ‘wheet-wheet whit-hu.’ They are very noisy birds, and they can often be heard long before the flocks come into sight. Their plaintive whistling note, which carries to a great distance, is uttered both when the birds are on the wing in flight from one place to another, and also when they are disturbed suddenly and take wing from the ground. This was very noticeable on the night of the 7th-8th March, when we were carrying out a night manœuvre preparatory to attacking the Digailah and Sinn positions. As we plodded along over the desert we continually disturbed considerable numbers of these birds which seemed to have ‘packed’ for the night in great numbers, though generally they are to be seen in pairs or singly, or in quite small flocks of a dozen birds or less.

“They come down to water both mornings and evenings after daylight and before sunset. When at the water they seem to keep

as a rule to the edges of the stream, pool or marsh at which they may be drinking and they do not seem to be so addicted to going right down into the water as does the Large Pin-tailed Sand-Grouse, for this latter bird seems to prefer to drink right in the centre of the pool or marsh rather than at the edges. Both species water at the same time, but the Spotted Sand-Grouse are generally the first arrivals in the morning and the last in the evening, but are never as numerous as the bigger bird, though I have sometimes seen as many as thirty drinking together. This was early in the year from March to July, when I left Mesopotamia, and when I returned in September I at once noticed it was far more common, and near Sinn I saw flights containing thousands of birds, though the flights seemed to be composed of numerous separate flocks.

"They are extremely easy to distinguish from their bigger cousins when on the wing both by voice and appearance. The black patch on their stomachs and their general pink appearance are easily discernible at a good distance and at a closer distance the dark outer edges to their wing-coverts show up well. On the ground also they appear, especially in the hot sunshine and glare, much greyer than *P. a. caudatus*, whilst the orange throats are noticeable from some way off.

"Unlike the larger Sand-Grouse they do not frequent the flat thinly grassed plains but prefer arid patches of 'pat' land, or bare deserts and sandy wastes. They are rarely seen in the near vicinity of camps, though near the Sinn position they were present in thousands with camps not very far from their feeding and resting grounds. In this place the bare ground was peculiarly suitable to their tastes and one could always find them hunting for grain which had been scattered about on the broad, dusty convoy and motor roads which intersected the country in many directions. This habit of collecting to feed on the fallen grain was interesting as showing that they are grain- as well as seed-eaters when they have the chance.

"They were not so tame or foolish near the camps as the Large Pin-tailed Sand-Grouse, yet when one came on them feeding near or on these roads they often allowed an approach on horseback to within a few yards before they sought safety in flight."

Jourdain informs me that each species of Sand-Grouse he met with in Algeria, i.e., *orientalis*, *alchatus* and *senegallus*, had quite distinct call-notes, and as they all constantly uttered these notes when on the wing, it was easy to tell without looking what species was approaching. "To me the cry of *senegallus* sounded like *greet-to greet-to*, but I did not attempt to write it down, and Koenig syllabizes the call as '*ki-ku, kawa kawa, ki-ku kawa kawa.*'"

Mr. Percy Hyde, to whose letter I have already referred, says that he found them "tame, confiding birds, easy of approach and easy to shoot, and for the table far superior to the Close-barred Sand-Grouse, which was very plentiful round about Karachi."

Captain Pitman, however, does not consider them as good eating as the Large Pin-tailed Sand-Grouse, and says that old birds require hanging for some time, as otherwise they are very tough.

Their food seems to be much the same as that of *P. a. caudatus* and consists to a great extent of the seed of the same *Polygonum* as that on which that bird feeds for much of the year.

As regards India there is nothing added to what Hume has already recorded:—

"They keep together in parties of from five to fifty; very often each flock, at any rate in winter, consists of one sex only, but occasionally I have found both sexes intermingled. They trot about on the dry soil picking up seeds and occasionally insects, or squat motionless sunning themselves in the morning sun. They fly off to drink morning and evening, often at comparatively distant localities, and generally comport themselves much as *P. exustus* and *arenarius* do but are more birds of the wilderness than these.

"Their food is mostly seeds, but I have found a good many insects mixed with these in the stomachs of those I have examined, and they are, I infer, less purely vegetarians than the Large Sand-Grouse."

Genus SYRRHAPTES.

The genus *Syrrhaptes* contains two species only, of which one comes within Indian limits. This can be at once distinguished from all other sand-grouse by its greater size—its wing is always over 9 inches—by the want of a hallux or hind-toe, and by its tarsi being feathered all over, i.e., behind as well as in front, and by the upper surface of its toes also being feathered.

It has the central tail-feathers elongated as in *Pterochlorus*, and the wings are long and strongly pointed. In general appearance it is a typical sand-grouse.

The genus is confined to Central Asia as a resident, but there are periodical rushes of *Syrrhaptes paradoxus* into Europe even as far as Great Britain.

SYRRHAPTES TIBETANUS.

THE TIBETAN SAND-GROUSE.

Syrrhaptes tibetanus, Gould, *P. Z. S.* p. 92, 1850 (Ladakh in Tibet); *id.* *B. of Asia*, vi, pl. 61; Blanford, *J. A. S. B.* xli, part 2, p. 71; Hume & Hend. *Lahore to Yark.* p. 279; Hume, *S. F.* vii, pp. 162, 425; *id.* *Cat.* No. 802; Hume & Marsh. *Game-B.* i, p. 43; Sharpe, *Yark. Miss. Aves*, p. 119; Ogilvie-Grant, *Cat. B. M.* xxii, p. 5; Blanford, *Avifauna B. I.* iv, p. 63; Oates, *Game-B.* i, p. 18; Sharpe, *Hand-L.* i, p. 50; Oates, *Cat. Eggs B. M.* i, p. 75; Ogilvie-Grant, *Game-B.* i, p. 6; Ward, *J. B. N. H. S.* xvii, p. 944; Le Mess. *Game-B.* p. 53; Bailey, *J. B. N. H. S.* xxi, p. 179; Stuart Baker, *ibid.* xxiii, p. 190; Hartert, *Vog. Pal.* p. 1516 (1920).

Vernacular Names. *Kuk*, Kaling, Ladak; *Kaka lingma*, *Kakali*, Tibet.

Description. **Adult Male.**—Head from forehead to nape white finely barred with black, the forehead more streaked than barred,



THE TIBETAN SAND-GROUSE.

male below

Syrhaptes tibetanus

female above

1 life

and the lores either immaculate or very finely streaked; angle of chin white changing into dull orange-yellow on chin, throat, fore-neck and in a narrow band on the nape. Hind-neck white narrowly barred with black, the ground-colour changing into vinaceous-buff or buff on the upper back, and the bars changing to vermiculations, becoming most minute on the upper back; lower back, rump and upper tail-coverts greyish-white vermiculated with narrow black bands, which are broadest and most definite on the rump; the rump and upper tail-coverts are often tinged with yellow, giving a sort of golden sheen to these parts. Scapulars, wing-coverts and innermost secondaries buff, the greater secondary-coverts, scapulars and secondaries often tinged with rufescent and somewhat contrasting with the smaller coverts, the whole very finely vermiculated with brown and the scapulars also marked with large blotches of black on the inner web, these forming a narrow triangular patch on the back. Primary-coverts and primaries black, the latter greyish towards the end and with large greyish-buff marks on the inner webs of all but the first four, though obsolete on the fifth and sometimes on the sixth; outer secondaries gradually changing from the colour of the primaries to that of the inner secondaries. Axillaries black, under wing-coverts on shoulder vermiculated brown and white, remaining aspect of under wing brown. Fore-neck and upper breast vinous-grey or vinous-white, narrowly barred with dark-brown or blackish, the ground-colour deepening towards the lower breast and the bars becoming very narrow; lower breast vinous-grey; abdomen, flanks and shorter under tail-coverts white, remaining under tail-coverts chestnut, barred with black and tipped white; thigh feathers white with tiny brown vermiculations; central tail-feathers like the rump and upper tail-coverts, but prolonged with long narrow-webbed filaments of dark grey; remaining tail-feathers like the longer under tail-coverts.

The general tint of the upper plumage depends principally on the scapulars and the inner secondaries, the back and rump not differing much individually. In some birds the parts first mentioned are quite a bright pink-vinaceous with the black markings almost entirely concealed by the ends of the overlapping feathers, in others, the feathers being abraided, the black spots form large patches and

the surrounding parts are tinged with dark-buff or yellow-buff, sometimes even with buff-ochre.

The yellow on the throat varies greatly in intensity and the markings on the breast not infrequently descend right down to the white abdomen. The thighs and feet are, also, sometimes quite thickly covered with fine dark bars.

Colours of Soft Parts.—“Bill and nails bluish-horny; soles whitish.” (*Hume.*)

Measurements. Males.—“Length 18 to 20 inches, expanse 29 to 31, wing 9·9 to 10·5, tail (according to development of central tail-feathers) 7·5 to 9·5, tarsus (which even in the fresh bird is very hard to measure) 1·1 to 1·3, bill from forehead to tip, ‘74 to ‘78.” (*Hume.*)

The small series I have been able to examine have had wings varying from 9·98 inches (= 254·3 mm.) to 10·63 (= 270 mm.) with an average of 10·35 (= 261·9 mm.). I have also measured tails up to 10·4 (= 263·10 mm.), though this was unusually long, and most are only about 8 (= 203·2 mm.).

Description. Adult female.—The adult female differs from the adult male in having the chin and throat albescent and more or less freely barred with brown; the breast is barred throughout, and there is no intermediate band of grey between the barred part and the white abdomen. The whole of the upper parts and wing-coverts, which are only vermiculated in the male, are regularly barred in the female, except the rump, upper tail-coverts and central tail-feathers and even these are decidedly more boldly marked than in the male. The general tint also is more grey and less vinous, though it varies in both sexes.

The upper plumage may be in general tone sandy-grey, grey much suffused with ochreous on scapulars and wings, or grey with these parts as pink or vinous as in the male. There are birds from Tibet and another specimen from Ladak in the British Museum which have as beautiful a pink-vinaceous tint as there is in any of the males, and they also have the wing-coverts covered with fine stippling and vermiculations instead of the usual barring. One of these is probably a young bird, and, though both are sexed females, there may be some mistake. Below, the extent of the breast differs in various individuals and in some birds is darker than in others. Soft parts as in the male.

Measurements. Females.—"Length 16·5 to 18·0, expanse 27 to 28, wing 9·7 to 9·9, tail 7·0 to 8·4, tarsus 1·1, bill as before 0·72 to 0·73." (*Hume.*)

I have been able to take the measurements of some twenty females, and these bear out Hume's measurements in making the females decidedly smaller than the males. The wings vary from 9·80 inches (= 248·8 mm.) to 10·45 (= 266·4 mm.) and have an average of 10·11 (= 256·8 mm.), the tails are also much shorter, seldom exceeding 8·5 (= 215·9 mm.) and generally below 8 (= 203·2 mm.)

Young Male.—A young male has only faint traces of yellow at the sides of the neck; the barring on breast and back to tail is like that of the female, the deep black blotching to the scapulars is almost wanting, the median coverts and inner secondaries are much barred as well as vermiculated, but the rest of the wing-coverts are marked as in the male. The wing of this bird is only 8·85 inches (= 223·8 mm.).

"A quite immature male resembles the adult female but has only a trace of yellow about the ear-coverts, and the barring of the upper parts of the body is coarser and more irregular." (*Ogilvie-Grant.*)

Distribution.—"Thibet, extending northwards to the Koko-Nor, west to the Pamir, and south to Ladakh and the Suttlej Valley." (*Ogilvie-Grant.*)

Hitherto the Tibetan Sand-Grouse has only been found within Indian limits in Ladakh and the Suttlej Valley, but it has been known to extend close to Sikhim in Tibet, and Blanford was given some caged birds by the Governor of Kambajong which were procured just across the border. Now, however, I have been sent eggs taken in Sikhim which are most undoubtedly those of *Syrrhaptes*, and, though they happen to be a very small-sized set, they cannot be anything else but *tibetanus*, as *paradoxus* could not possibly occur there.

Hume found them in great numbers on the Roopshoo plains about the Tso Mourari and Tso Khar and the head of the Pangong Lake, which is just inside the eastern boundary of Ladakh. Biddulph also found them near this latter lake at 15,000 feet and again at 18,000 feet on the Karakorum Pass.

Nidification.—There is practically nothing on record about the breeding of this fine sand-grouse, but Oates writes as follows about two eggs now in the British Museum collection. “These two eggs were found by Mr. St. George Littledale, and . . . although they have no further history, doubtless belong to this species. These eggs are perfectly elliptical, rather glossy, and measure, the one 1.9×1.37 inches and the other 2×1.33 inches. They are of a light stone-colour with a number of pale-purple shell-marks and numerous surface dots and marks of reddish-brown, evenly distributed over the egg.”

Beyond the above eggs the only others are those mentioned by Colonel Ward and some in my own collection. Colonel Ward writes (*in loc cit.*): “The Tibetan Sand-Grouse is found in flocks in Tibet and eggs were taken by Captain W. Leslie on the eastern borders of that district on the 22nd, 23rd and 25th June.

One of these eggs which Colonel Ward gave to Dr. H. N. Coltart is now, through the latter's generosity, in my own collection. This and a second egg of the same clutch, which I obtained from the collection of Colonel R. Buchanan agree well with a clutch of three eggs received from Sikhim and two others, one of three and one of two, sent to me from Tibet. Those from Sikhim have no data with them except that they were got from a high plateau in the north-east of Sikhim by villagers in the month of June; those from Tibet were taken near the Chambi Valley on the 16th and 18th June. The birds are said to be common in many parts of Tibet, and *very* common in some, but I have failed to get any more eggs, though Captains F. M. Bailey, R. S. Kennedy, D. Macdonald and L. Weir have all collected for me in that country very fine series of eggs of many extremely rare species.

All these eggs in my collection, with the exception of Colonel Ward's, resemble one another very closely and are exactly like the eggs of *Syrrhaptes paradoxus* in the British Museum. The ground-colour is a pale stone-colour, in some being of a rather warmer tint, more a creamy-buff, and the markings consist of spots, specks, and blotches, the last predominating, of brown, some yellowish, some reddish, the two tints varying in different specimens. The secondary marks are of the same character, and in colour are a washy purple-

grey or lavender-grey, here and there being one of a rather deeper purple. The eggs have a fair gloss, in one clutch a rather high gloss, and the surface is smooth with a fine, close grain, but the shell is rather fragile for so big an egg.

Colonel Ward's two eggs have a pale pinkish-brown ground-colour; the spots and blotches being rather larger and darker though less numerous. The eggs vary in size between 1.75×1.17 inches ($= 44.4 \times 29.7$ mm.) and 1.85×1.25 ($= 47.0 \times 31.7$ mm.), but there is little doubt my smaller eggs are abnormally so.

A third of Captain Leslie's specimens, which I obtained from the Buchanan collection, is different from all the rest. The ground colour is a very pale, dull yellow-stone and the markings consist of small irregular blotches and specks of rich reddish-brown with others underlying them of pale neutral tint. The markings are distributed sparsely all over the surface, rather more profusely, perhaps, over the central portion of the egg, but not enough so to form a distinct zone. This egg measures 49.8×33 mm.

General Habits.—It descends only to about 12,000 feet in the summer, but probably much lower in the winter months. Hume says:—

"I do not think I have ever met with this species at elevations above 17,000 or below 12,000 feet, but I have, of course, only seen it between 1st June and 15th September and during the colder months it may descend lower."

"Although it keeps on barren and desolate steppes in the neighbourhood often of rocky ranges, I have never seen it (the experience of others seems to be different) on these or on steep hillsides, and I have always noticed that there was sure to be some water, fresh or brackish, within a reasonable distance of its feeding ground.

"In the morning and afternoon it moves about on the more or less undulating semi-desert plains feeding on grass and other seeds and berries, and any young green shoots it can find. During the middle of the day it squats about, especially if the day be hot, basking in the sun, very generally scratching for itself a small depression in the soil.

"Both when feeding and taking its siesta, it is not uncommonly in considerable flocks (I have seen several hundreds together); but in summer, at any rate, it is perhaps more common to meet with it in little parties of from three to twenty. Whilst feeding, it trots about more rapidly and easily than its short feather-encased legs

and feet would lead one to suppose; individuals continually flying up and alighting a few yards further on, and now and again the whole flock rising and flying round, apparently without reason or aim.

"Sometimes it is very shy, especially in the early mornings and evenings; and though it will not, unless repeatedly fired at, fly far, it will yet not let you approach within one hundred yards; but, as a rule, during the heat of the day, you may walk right in amongst them. They are precisely the colour of the sand when basking, and often the first notice you have of their proximity is the sudden patter of their many wings as they rise and dart away, and the babel of their cries, which, if the flock be a large one, is really startling for a moment. Once up, they are off and away with a rapidity that takes a good shot and a hard hitting gun to deal with satisfactorily, but they rarely at mid-day go far, and if the sun is bright, you may get shot after shot out of the same party by following them up.

"Early in the morning and quite at dusk they come down to the water to drink, by preference to fresh water, but, as at the Tso-Khar, at times, to quite brackish water.

"They are always noisy birds when moving about, uttering a call somewhat like '*guk-guk*' to my ear, or again, as some people syllabize it '*yak-yak*,' '*caga-caga*,' etc., etc., but they are specially noisy in the evenings when they come down to drink, and quite late in the evening, when wearied with the day's tramp in those high regions, dinner discussed and the peaceful pipe achieved, one turns in for the night, their characteristic double cry may still be heard round the tents, pitched always, of course, when possible, near water."

"Mountaineer" remarks that they are met with in pairs, sometimes singly, and also in flocks of half-a-dozen or a dozen, on the hills and upland plains, at from 14,000 to 17,000 feet. They lie close until one gets within fifty or one hundred yards, and then fly up with the usual chuckle, generally alighting again at no very great distance."

According to Blanford this "is a very noisy bird, often repeating its clanging double note when on the wing. Some caged birds that were given to me on the north frontier of Sikhim constantly uttered this call. The flight is swift."

Major F. M. Bailey says that he found "these birds in flocks of from ten to twenty anywhere north of the Tangla from August to February, and I have once seen them in May. They appear to have

no special hour for drinking, and are not at all shy, so it is possible to walk up within gunshot distance when they are feeding on the bare plains. On being fired at a flock will only fly a hundred yards or so and will allow another shot to be taken in the same manner. In this way a flock could easily be exterminated, as they do not seem to get any wilder. I have seen them at Kambajong and at various places in the Brahmapootra Valley, west of Shigatse. I made every effort to get the eggs of this bird but without success."

He also informs me that they are seldom found actually in snow, and that the plate given here cannot be taken as typical of the country they inhabit though in the Chambi Valley they are often found in snow on the higher reaches.

INDEX.

Arabian Close-barred Sand-Grouse,
273-277.

Bengal Florican, 216-234.

Black-bellied Sand-Grouse, 240-251.

Bustard, 136, 137, 198.

——, Great, 140-155.

——, Great Indian, 165-185.

——, Little (Eastern form), 156-164.

——, Lesser, 209.

——, Macqueen's, 186-197.

——, re-introduction into England,
155.

Bustard-shooting, 152, 153, 176-182,
192-196.

Chlamydotis undulata macquennii,
186.

——, description of, 187.

——, distribution of, 189.

——, general habits of, 191.

——, measurements of, 188,

——, nidification of, 189.

——, shooting of, 192-196.

——, synonyms, 186,

Close-barred Sand-Grouse, 273-277.

Coronnetted Sand-Grouse, 265-271.

Eupodotis edwardsi, 165.

——, description of, 166.

Eupodotis edwardsi, distribution of,
167.

——, general habits of, 173.

——, measurements of, 166, 167.

——, nidification of, 169.

——, shooting of, 177-184.

——, synonyms, 165.

Fantail Snipe, 54-77, 90, 96.

Florican, Bengal, 216-234.

——, Lesser, 199-215.

Florican-shooting, 212, 232, 233.

Gallinago gallinago gallinago, 34, 54.

——, bleating of, 70-73.

——, description of, 55.

——, diet of, 75,

——, distribution of, 59.

——, drumming of, 59, 70.

——, general habits of, 61, 90, 96.

——, measurements of, 56.

——, migration of, 62.

——, nidification of, 59.

——, shooting of, 67.

——, synonyms, 54.

Gallinago gallinago raddei, 34, 78.

——, description of, 78.

——, nidification of, 79.

Gallinago gallinula, 34, 107.

——, description of, 107, 113.

- Gallinago gallinula*, distribution of, 108.
 —, drumming of, 113, 115.
 —, general habits of, 117.
 —, measurements of, 108.
 —, nidification of, 112.
 —, synonyms, 107.
Gallinago media, 34, 80.
 —, description of, 80.
 —, distribution of, 81.
 —, general habits of, 84.
 —, measurements of, 81.
 —, nidification of, 82.
Gallinago megala, 34, 104.
 —, description of, 104.
 —, distribution of, 105.
 —, measurements of, 104.
 —, synonyms, 104.
Gallinago nemoricola, 35, 46.
 —, description of, 46.
 —, distribution of, 49.
 —, general habits of, 50.
 —, measurements of, 47.
 —, nidification of, 48.
Gallinago sabinii, 57.
Gallinago solitaria, 35, 36.
 —, description of, 36.
 —, distribution of, 39.
 —, general habits of, 43.
 —, measurements of, 37.
 —, nidification of, 40.
 —, synonyms, 36.
Gallinago stenura, 35, 86.
 —, description of, 86, 89.
 —, distribution of, 91.
 —, drumming of, 92, 102.
 —, general habits of, 90, 94.
 —, measurements of, 87, 88.
 —, migration of, 91, 96.
 —, nidification of, 92.
 —, shooting of, 98, 102.
Gallinago stenura, synonyms, 86.
 Grouse, 235.
 —, *see also* Sand-Grouse ; Pigeon-Grouse.
 Houbara, 159, 186-198.
 Houbara-shooting, 192-196.
 Imperial Sand-Grouse, 240-251.
 Jack Snipe, 107-119.
 Lichtenstein's Sand-Grouse, 238, 273.
 Likh, 199-215.
 Macqueen's Bustard or Houbara, 186-197.
Otis tarda dybowskii, 143, 145.
Otis tarda tarda, 137, 140.
 —, description of, 140.
 —, diet of, 151.
 —, distribution of, 142.
 —, general habits of, 148.
 —, measurements of, 141.
 —, nidification of, 145.
 —, re-introduction into England, 155.
 —, shooting of, 152.
 —, weight of, 141.
Otis tetrax orientalis, 156, 209.
 —, description of, 156.
 —, distribution of, 159.
 —, general habits of, 163.
 —, measurements of, 158.
 —, nidification of, 160.
 —, synonyms, 156.
 Painted Sand-Grouse, 252-264.
 Painted Snipe, 121-135.
 Pigeon-Grouse, 235.

Pintail Snipe, 86-103.

Pin-Tailed Sand-Grouse, large, 279-292.

Pterocles coronatus atratus (Hartert), 238, 265.

—, description of, 265.

—, distribution of, 268.

—, general habits of, 270.

—, measurements of, 266, 267.

—, nidification of, 269.

—, synonyms, 265.

Pterocles indicus, 238, 252.

—, description of, 252.

—, distribution of, 255.

—, general habits of, 259.

—, measurements of, 253, 254.

—, nidification of, 256.

—, synonyms, 252.

Pterocles lichtensteini arabicus, 238, 273.

—, description of, 273.

—, distribution of, 275.

—, general habits of, 276.

—, measurements of, 274, 275.

—, nidification of, 276.

—, synonyms, 273.

Pterocles orientalis, 238, 240.

—, description of, 240.

—, distribution of, 243.

—, general habits of, 246.

—, measurements of, 241, 242.

—, nidification of, 244.

—, shooting of, 248.

—, synonyms, 240.

Pteroclorus alchatus caudacutus, 238, 279.

—, description of, 279.

—, distribution of, 283.

—, general habits of, 286.

—, measurements of, 280, 281.

—, nidification of, 283.

Pteroclorus alchatus caudacutus,
synonyms, 279.

Pteroclorus senegalensis erlangeri,
238, 278, 293.

—, description of, 293.

—, distribution of, 297.

—, general habits of, 302.

—, measurements of, 294, 296.

—, nidification of, 298.

—, shooting of, 304.

—, synonyms, 293.

Pteroclorus senegallus, 278, 307.

—, description of, 307.

—, distribution of, 310.

—, general habits of, 313.

—, measurements of, 309, 310.

—, nidification of, 311.

—, synonyms, 307.

Radde's Snipe, 78.

Rostratula capensis, 121.

—, diet of, 133.

—, description of, 121.

—, distribution of, 124.

—, general habits of, 129.

—, measurements of, 123.

—, nidification of, 124.

—, synonyms, 121.

Sabine's Snipe, 57.

Sand-Grouse, 235.

—, Arabian Close-barred, 273-277.

—, Common Indian, 293-306.

—, Coronetted, 265-271.

—, Large, Imperial, or Black-bellied, 240-251.

—, Large, Pin-Tailed, 279-292.

—, Painted, 252-264.

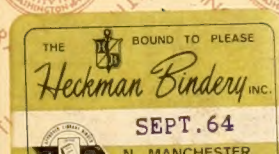
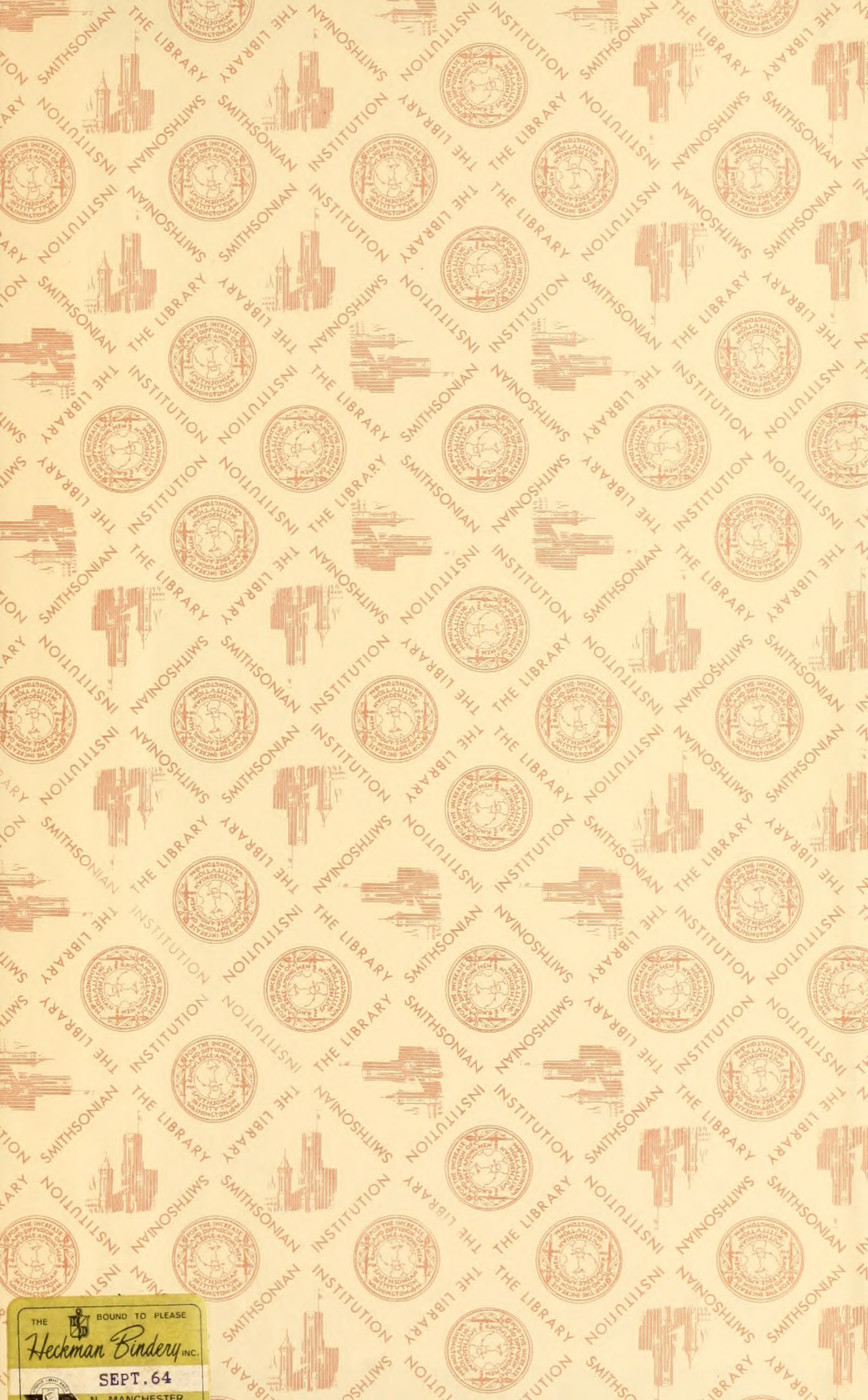
—, Spotted, 307-315.

—, Tibetan, 316-323.

Sand-Grouse-shooting, 248, 262, 291, 304, 322.

- Scolopax rusticola*, 2, 3.
 —, description of, 3.
 —, diet of, 33.
 —, distribution of, 10.
 —, general habits of, 14, 20.
 —, measurements of, 6.
 —, nidification of, 12.
 —, roding of, 13.
 —, shooting of, 22, 25-29.
 —, synonyms, 3.
 —, weight of, 9.
 Snipe, 2, 34.
 — Common or Fantail, 54-77, 90, 96.
 —, Great, 80-85.
 —, Jack, 107-119.
 —, Painted, 121-135.
 —, Pintail, 86-103.
 , Radde's, 78.
 , Sabine's, 57.
 , Solitary, 36-45.
 —, Swinhoe's, 104.
 —, Wood-, 46-53.
 Snipe-shooting, 67, 98, 102, 111.
 Spotted Sand-Grouse, 307-315.
 Swinhoe's Snipe, 104.
Sypheotis aurita, 198, 199.
 —, description of, 199.
 , diet of, 215.
Sypheotis aurita, distribution of, 202.
 —, general habits of, 210.
 —, measurements of, 201, 202.
 —, nidification of, 205.
 —, shooting of, 212.
 —, synonyms, 199.
Sypheotis bengalensis, 198, 208, 216.
 —, description of, 198, 216, 219.
 —, distribution of, 221.
 —, general habits of, 230.
 —, measurements of, 217, 218.
 —, nidification of, 224.
 —, shooting of, 222, 231-233.
 —, synonyms, 216.
Syrrhaptes tibetanus, 316.
 —, description of, 316, 318.
 —, distribution of, 319.
 —, general habits of, 321.
 —, measurements of, 318, 319.
 —, nidification of, 320.
 Tibetan Sand-Grouse, 316-323.
 Woodcock, 2, 3-33.
 —, English, 8, 25.
 Woodcock-shooting, 22, 25-29.
 Wood-Snipe, 46-53.





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